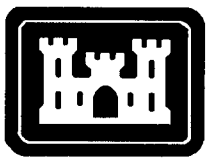

Contract No. DACW29-97-D-0018
Delivery Order 0010

U.S. Army Corps
of Engineers
New Orleans District

PHASE I CULTURAL RESOURCES SURVEY AND INVENTORY OF THE PROPOSED VERMILION RIVER DREDGE MAINTENANCE PROJECT, LAFAYETTE PARISH, LOUISIANA

October 1999

FINAL REPORT

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PREPARED FOR:

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13. ABSTRACT ***(Maximum 200 words)***

This technical report presents the results of Phase I cultural resources survey, assessment, and archeological inventory of the proposed U.S. Army Corps of Engineers Vermilion River Dredge Maintenance Project in Lafayette Parish, Louisiana. The investigation included both terrestrial and marine components, and it was completed following the Scope of Work provided by the Corps. The field work portion of these investigations was completed by R. Christopher Goodwin & Associates, Inc., between May and June, 1998.

The proposed Vermilion River Dredge Maintenance incorporates a marine survey corridor located on the Vermilion River between river mile 47.5 and mile 48.4 in Lafayette Parish, Louisiana; this corridor encompasses an area measuring 53.7 ac (21.7 ha) in size. A second project item consists of a 35 ac (14.2 ha) land tract in Lafayette Parish, Louisiana. This tract fronts the Vermilion River just south of the town of Milton, Louisiana, in Section 50, Township 11S, Range 4E. In total, 88.7 ac (35.9 ha) were examined as a result of this investigation.

A marine remote sensing survey, utilizing side scan sonar, a recording proton precession magnetometer, and a fathometer, produced 21 magnetic anomalies and 10 acoustic anomalies. The magnetic and acoustic data recorded during the Vermilion River underwater survey indicates that the project area contains significant amounts of debris, but does not appear to contain anomalous readings consistent with those expected of submerged cultural resources. Therefore, no further marine archeological investigations are recommended for the Vermilion River Dredge Maintenance Project.

The terrestrial portion of the proposed project area was surveyed and inventoried through a combination of pedestrian reconnaissance, shovel testing, magnetometer survey, probing, and auger testing. A total of three archeological sites (16LY94, 16LY95, and 16LY97), two non-site cultural resources loci (4-1 and 5-1), and one standing structure older than 50 years in age (SS 1) were identified during the terrestrial Phase I survey and inventory.

Site 16LY94 and Site 16LY95 are nineteenth to twentieth century artifact scatters that have been disturbed by plowing. Neither of these two sites nor the two cultural resources loci are eligible for listing in the National Register of Historic Places. Standing Structure 1, a barn, also does not possess the qualities of significance as defined by the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]). No additional architectural recordation of Standing Structure 1 is recommended. Site 16LY97 consists of a nineteenth to twentieth centry cemetery that is also known as Picard Cemetery. It too was assessed as not significant applying the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]) as cemeteries normallly are not eligible for listing in the Register. Nonetheless, Site 16LY97 and a 15 m (49 ft) wide buffer area on its north and east sides should be avoided during the proposed dredged material disposal.

14. SUBJECT TERMS

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20th Century	Civil War	Magnetometer Survey
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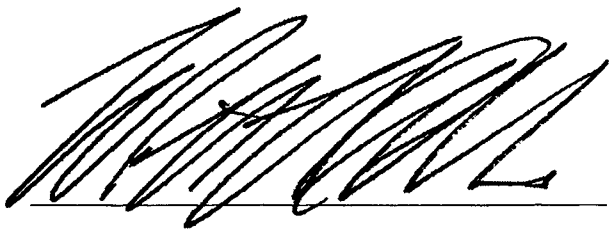
PHASE I CULTURAL RESOURCES SURVEY AND INVENTORY OF THE PROPOSED VERMILION RIVER DREDGE MAINTENANCE PROJECT, LAFAYETTE PARISH, LOUISIANA

FINAL REPORT



William P. Athens, M.A., A.B.D.
Principal Investigator

By

Randy Lichtenberger, Dave Robinson, Ralph Draughon, Jr.,
Dr. Roger Saucier, and William P. Athens

with contributions by

Ryan Crutchfield, Adam Kane, Luis M. Williams, Jr., J. B. Pelletier,
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October 1999

For

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CHAPTER I

INTRODUCTION

This report presents the results of Phase I cultural resources survey and archeological inventory of the proposed U.S. Army Corps of Engineers Vermilion River Dredge Maintenance Project in Lafayette Parish, Louisiana. The investigation included both terrestrial and marine components and it was performed in accordance with the National Park Service's National Register Bulletin 15 entitled *How to Apply the National Register Criteria for Evaluation*; with the Secretary of the Interiors "Standards and Guidelines" (48 FR 44716-42); with Louisiana's Comprehensive Archeological Plan, dated October 1, 1983; with the Advisory Council on Historic Preservation's handbook entitled *Treatment of Archeological Properties*; with 36 CFR 800; and with the Louisiana Submerged Cultural Resource Management Plan published by the Louisiana Division of Archaeology in 1990. These investigations were completed between May and June, 1998, by R. Christopher Goodwin & Associates, Inc., on behalf of the U.S. Army Corps of Engineers, New Orleans District, pursuant to Contract DACW39-97-D0018, Delivery Order 0010.

Project Description

The proposed Vermilion River Dredge Maintenance Project incorporates a marine survey corridor located on the Vermilion River between River Miles 47.5 and 48.4 in Lafayette Parish, Louisiana (Figures 1 and 2). Approximately 1.45 km (0.9 mi) of river bottom were surveyed for cultural resources; the endpoints of the area surveyed coincided with Corps survey stations 0+00 and 52+00.00 of the proposed dredge area. Current project plans call for dredging this portion of the Vermilion River. Water depths in the project area currently range from 0.9 to 3 m (3 to 10 ft). Land use near the project area consisted primarily of suburban development. Numerous houses front the river and most residents have attempted to stabilize the riverbank using iron, wooden, or fiberglass bulkheads. Other residents have lined the riverbank with a layer of concrete filled sandbags. Small docks, boats, drainage culverts, and modern architectural debris and refuse also were noted along both banks of the river.

The terrestrial portion of the project includes a 35 ac (14.2 ha) tract of land located in Lafayette Parish, Louisiana. This tract fronts the Vermilion River just south of the town of Milton, Louisiana, i.e., in Section 50, of Township 11S, Range 4E (Figure 3). The parcel is located south of the proposed dredge area and it will serve as a disposal site for the material excavated during dredging of the Vermilion River. The dredged material will be transported by barge to the proposed disposal site. This area currently is used as a cattle farm. Anselm Coulee, a tributary of the Vermilion River, bisects the tract. Two modern residences and several outbuildings associated with the farm are located in the northeast corner of the project area. The owner of this farmstead, Ms. Victoria Bourque, has occupied the property since 1949 (Bourque 1998, personal communication).

Finally, a previously known cemetery, the Picard Cemetery, also was identified in the southwestern corner of the project area. The Picard Cemetery (Site 16LY97) occupies an area measuring approximately 50 x 100 m (164 x 329 ft) in size and it dates from the mid-nineteenth century. The cemetery is depicted on the 1983 (and 1993 photorevised) USGS 7.5' Milton topographic quadrangle; it is surrounded by an un-

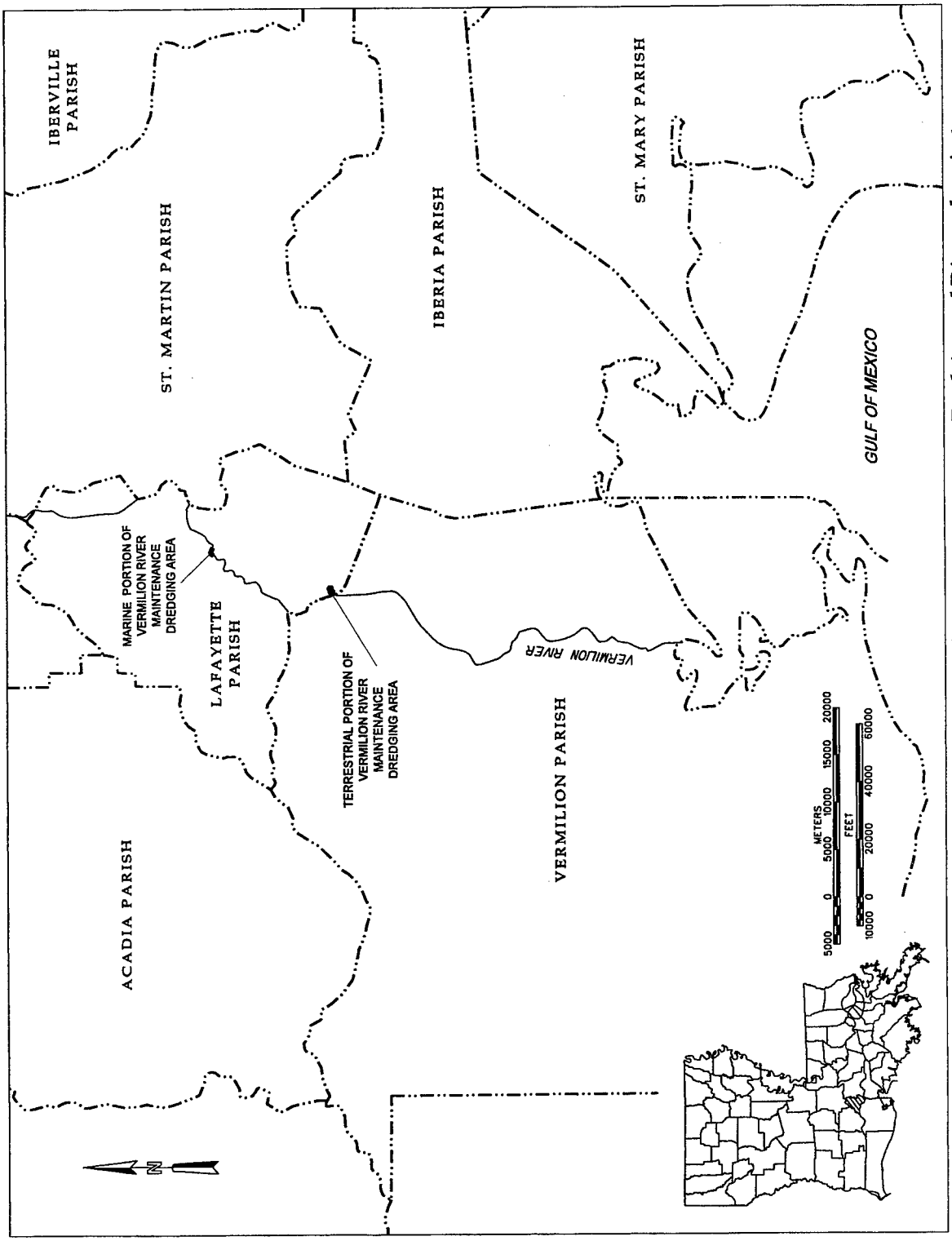


Figure 1. Map of Louisiana depicting the proposed Vermilion River Maintenance Dredging and Disposal project areas.

Figure 2. ***Excerpt from the 1996 digital 7.5′ series topographic quadrangle, Lafayette, Louisiana, depicting the proposed Vermilion River Maintenance dredge corridor.***

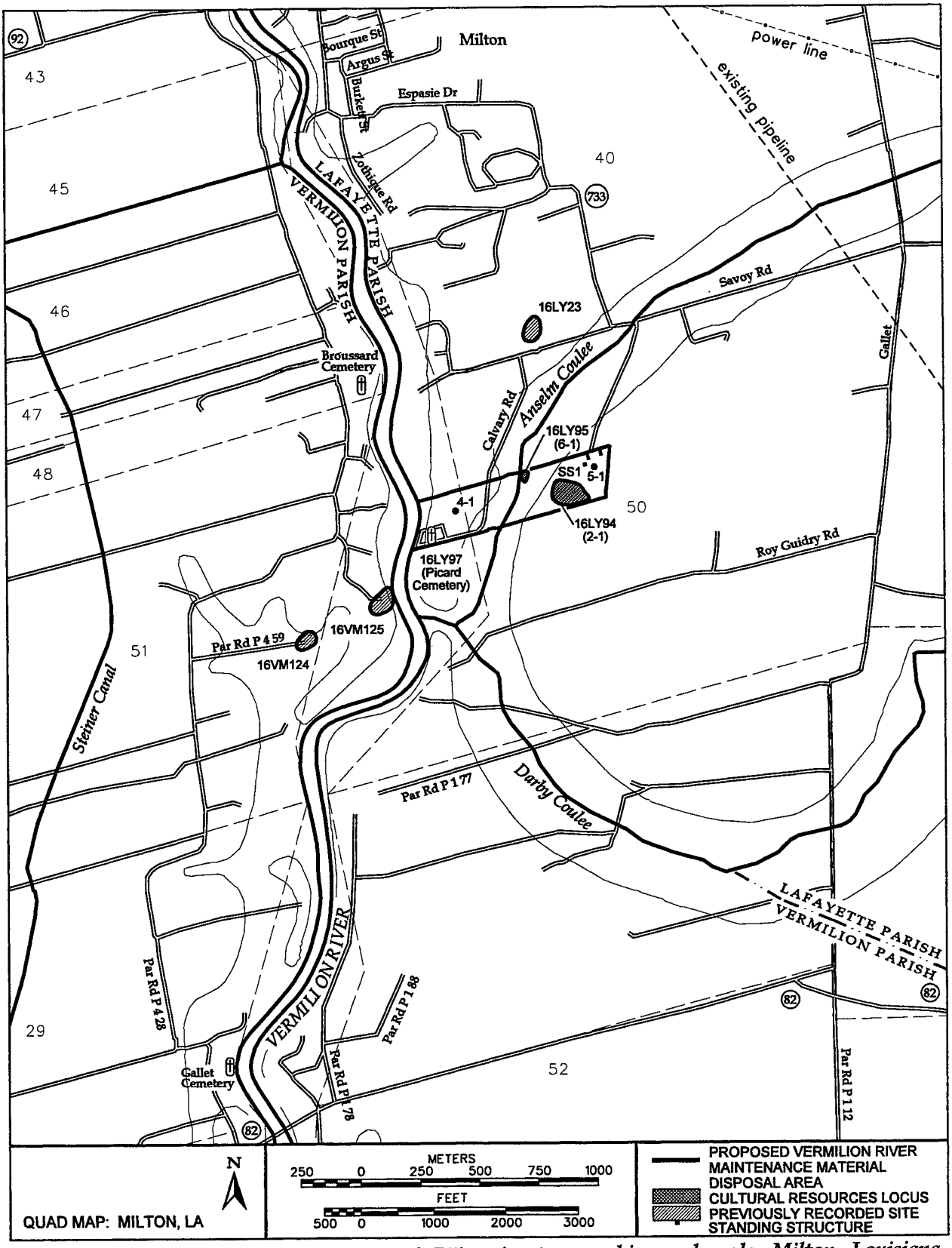


Figure 3. ***Excerpt from the 1996 digital 7.5′ series topographic quadrangle, Milton, Louisiana, depicting the proposed Vermilion River Maintenance dredged material disposal area, and cultural resources identified during Phase I cultural resources survey and inventory.***

improved road, and currently it is bounded by barbed wire and chainlink fences. In partial fulfillment of the Scope of Work, an area located immediately adjacent to the Picard Cemetery was subjected to magnetic survey and limited excavation to determine whether the extant fenceline actually represents a valid boundary for the cemetery.

Project Personnel

William P. Athens, M.A., served as Principal Investigator and supervised all aspects of the study. Dr. Cinder Griffin Miller, Mr. Patrick P. Robblee, M.A., and Mr. Randy Lichtenberger, M.A. served as Project Managers for the terrestrial survey. Mr. Lichtenberger was responsible for integrating the underwater and terrestrial survey results into a single report. He was assisted in the report writing by Dr. Ralph Draughon, Jr., Mr. Ryan Crutchfield, M.A., Mr. Michael Godzinski M.A., Ms. Charlene Keck, M.A., and Ms. Angele Montana, M.A. Terrestrial fieldwork was performed with the assistance of Mr. Godzinski, M.A., Mr. William Hayden, M.A., Ms. Elsa Heckman, B.A., Mr. Ben Hocksbergen, B.A., Ms. Rebecca Johnson, B.A., Ms. A.C. Logan, B.A., Mr. Jeremy Pincoske, B.A., Mr. Jeremy Pooler, B.A., and Ms. Jennifer Preisler, B.A.

Mr. David S. Robinson, B.A., and Mr. Adam I. Kane, B.A., conducted the remote sensing investigation. Mr. Jean B. Pelletier, M.A., served as Nautical Archeologist and supervised the field survey.

Laboratory analysis was directed by Ms. Charlene Keck, M.A. Graphics were prepared by Mr. Jeremy Horowitz, B.A., Mr. Adam Kane, B.A., Ms. Faith Leech, B.A., Ms. Shirley Rambeau, A.A., Mr. Barry Warthen, B.A., and Mr. Reid Wraase, B.A.

Organization of the Report

The natural setting of the project vicinity is presented in Chapter II, which includes a brief description of the regional geology, geomorphology, floral and faunal communities, and climate. The prehistoric and historic cultural overviews of the project area are contained in Chapters III and IV, respectively. Chapter V provides a review of previous archeological investigations and previously recorded sites located in the immediate vicinity of the project corridor. Chapter VI contains a discussion of the research design, field methods, and laboratory procedures used during this Phase I cultural resources survey and archeological inventory. Chapter VII presents the results of this investigation. Chapter VIII contains a summary of the report and management recommendations. A list of the artifacts recovered during the Phase I investigation is included as Appendix I. A copy of the Scope of Services is included as Appendix II. Appendix III contains Louisiana archeological site forms and standing structure forms for all archeological sites and historic standing structures identified during the investigation.

CHAPTER II

NATURAL SETTING

Introduction

Environmental factors often influence the distribution of humans across the landscape and the preservation of the archeological deposits left behind. This chapter identifies those processes that characterized the development of the Vermilion River Dredge project area and examines their influence upon both prehistoric and historic settlement and subsistence strategies throughout the region. Prior to initiating fieldwork, an overview of the natural setting of the proposed project area was completed; this served as an aid for identifying those areas likely to contain cultural resources. In addition, these data were used to predict the possible types, chronologies, and quality of the archeological deposits associated within them. Correspondingly, the model was used to eliminate from consideration those areas unlikely to contain prehistoric or historic period cultural resources.

Project Description

The proposed Vermilion River Dredge Maintenance Project items includes a riverine survey corridor along the Vermilion River that encompasses a total of approximately 53.7 ac (21.7 ha) within the limits of Lafayette, Lafayette Parish (Figure 2). Currently, water depths along this stretch of the river range from approximately 0.9 to 3.1 m (3 to 10 ft), and proposed project plans call for the dredging of sediment in this area. Modern land use along this portion of the proposed project area primarily consists of suburban development. Numerous houses front the river and a majority of these residents have stabilized the riverbank by constructing iron, wooden, or fiberglass bulkheads. Other residents have lined the riverbank with layers of concrete-filled sandbags. Small docks, boats, drainage culverts, and modern architectural debris and refuse also are found along both banks of the river.

A second project item, a 35 ac (14.2 ha) tract of land, is located approximately 17 km (10.6 mi) downstream and on the left descending bank of the Vermilion River in Lafayette Parish, Louisiana. This tract is located 1.9 km (1.2 mi) south of the town of Milton, Louisiana, in irregular Section 50 of Township 11S, Range 4E (Figure 3). It serves as the proposed disposal site for the materials to be excavated during the dredging of the Vermilion River. This item is situated on a cattle farm and it encompasses two modern residences and several outbuildings; these structures are located in the northeast corner of the proposed project item. In addition, a cemetery occupies the southwest portion of this project parcel.

Physiographic and Geologic Setting

The proposed project area is located within the general physiographic region of the West Gulf Coastal Plain section of the Gulf and Atlantic Coastal Plain province of North America (Murray 1961). More specifically, the proposed project area lies within a belt of Pleistocene coastwise terraces that stretches along the Gulf Coast. It is situated to the west of the Atchafalaya Basin portion of the Lower Mississippi Valley, and within a transition zone positioned

between the Holocene alluvial valley section to the north/northeast and the deltaic (chenier) plain section to the south (Figure 4).

The proposed project area is located on the Prairie Terrace complex, the youngest of several terraces that constitute the coastwise terrace belt. Within the Prairie complex, the easternmost few kilometers, i.e., the area adjacent to the Atchafalaya Basin, has been designated as blufflands, while the remainder of the complex has been designated as prairie (or Southwest Prairies) because of the prevailing natural grassland vegetation that occurs there (Kniffen 1968). South of the proposed project area, the Prairie complex surface gently dips southward beneath the fresh to saline marshes associated with the Holocene chenier plain of southwestern Louisiana.

The blufflands can be characterized as a dissected terrace margin with incised local drainage. The average elevation of the terrace surface is 12.2 m (40 ft) above mean sea level (amsl), but local relief (including the terrace margin or scarp) is on the order of 6.0 to 7.6 m (20 to 25 ft) amsl. Across the prairie subsection, and in the proposed project area, local relief declines to less than 2.0 m (6.5 ft) amsl and elevations steadily declines to the southwest. The average elevation is approximately 3.0 m (10 ft) amsl in the Milton area, and elevations in the proposed dredged material disposal area range from 0.3 to 6.1 m (1 to 20 ft) amsl.

Local drainage networks on the Prairie complex surface are poorly developed, resulting in high groundwater tables and moderate to severe seasonal surface flooding. Essentially all surface drainage is controlled by relict Mississippi or Red River abandoned channels or abandoned courses of Holocene or Pleistocene age. The principal stream of the project vicinity, and the focus of the proposed project undertaking, is the southward-flowing Vermilion River. This river has a complex history marked by a series of progressively more underfit relict Pleistocene channels that were occupied and modified during the Holocene by both Mississippi River flood overflows and Red River discharge. In addition to the Vermilion River, one other watercourse (Anselm Coulee) is found within the survey area. Anselm Coulee bisects the proposed terrestrial project parcel; however, it is a relatively minor underfit drainage channel that occupies a Pleistocene-age abandoned Mississippi River channel. Anselm Coulee probably was not navigable either during the prehistoric or historic periods.

Geologically, the project vicinity lies near the southern limit of the broad, north-south trending Mississippi Embayment, i.e., near the area where it joins the east-west trending Gulf Coast Geosyncline (Murray 1961; Saucier 1994). In combination, these two deep, subsiding structural troughs have resulted in the deposition during the Tertiary and Quaternary Periods (Cenozoic Era) of tens of thousands of meters of sediments in alternating fluvial, deltaic, estuarine, and shallow marine environments. During the millions of years of deposition, the thick sedimentary sequence has witnessed the formation of zones of east-west trending growth faults and the intrusion of diapiric salt domes (Autin et al. 1991).

Within this overall structural geologic framework, events relevant to the current study are those that have occurred during the Pleistocene and Holocene epochs of the Quaternary Period, since all deposits within several hundred meters of the surface are of this age. Constituting the last 2.5 million years of geological time, these epochs were dominated by the cyclical advance and retreat of continental glaciers and the rise and fall of sea level. Glaciers did not directly affect the Lower Mississippi Valley area, but on several occasions the alluvial valley served as a giant sluiceway for the transport of vast quantities of meltwater and glacial outwash to the Gulf of Mexico. Glacial stages were episodes marked by a Mississippi River braided stream regime, the transport and deposition largely of sands and gravels, and relatively low sea level stands (Autin et al. 1991). In contrast, interglacial stages were times of stream meandering and meander belt formation, predominantly fine-grained sediment loads (silts and clays), and relatively high sea level stands. Near the Gulf Coast, glacial stages were characterized by stream entrenchment with the shoreline positioned well south of its present location. Interglacial stages were times of entrenched valley filling, transgressing shorelines, and eventually deltaic plain formation by delta lobe growth and decay.

In the project region, the Mississippi alluvial valley experienced incision and widening during the last (or Late Wisconsin) glaciation.

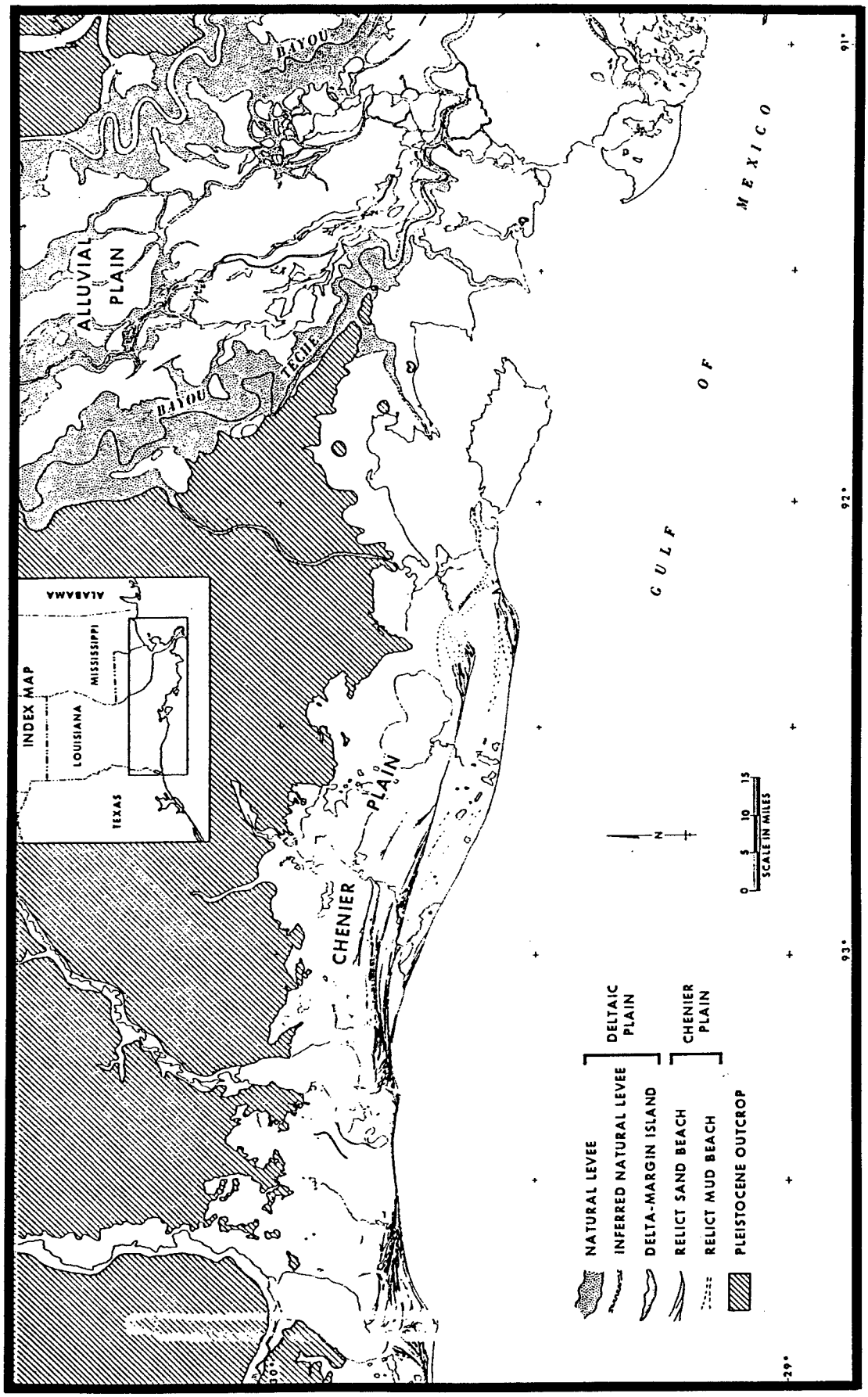


Figure 4. Physiographic features of a portion of coastal Louisiana. From Frazier and Osanik 1965.

The alluvial fill was deposited mostly during the waning of that glaciation (decay of the Laurentide ice sheet) during an episode known as the Holocene sea level transgression. The Pleistocene formations into which valley incision took place were deposited during the Sangamon and Middle Wisconsinan stages. Laterally away from the entrenchment, these Pleistocene formations constitute the young Prairie complex terrace of the project area. Traditionally, the terrace (of Mississippi River origin) has been referred to as the Prairie terrace (Fisk 1939; Russell 1938), but recently it has been designated as the Prairie complex (Autin et al. 1991; Saucier 1994) in view of a better understanding of its multiple origins and long history of development. Intermediate in age and elevation between the Prairie complex and the Holocene floodplain are remnants of a terrace of Red River origin that has not been given a formal designation.

In various parts of south Louisiana and adjacent states, the Prairie complex includes sediments laid down during multiple glacial cycles in an even greater variety of environments, including fluvial, estuarine, deltaic, and shallow water marine (Saucier 1994). In the vicinity of the project area, however, most of the sediments in the upper several tens of meters were deposited in Mississippi River meander belt environments. These consisted principally of point bar, abandoned channel, and natural levee environments, comprising what has been referred to as the Lafayette Meander Belt (Goodwin et al. 1991) (Figure 5). Although at least 30,000 years old, characteristic meander belt morphology is still strongly evident on the terrace surface (e.g., point bar ridge and swale topography) despite a thin surficial blanket or veneer of loess measuring up to 6.1 m (20 ft) in thickness (Figure 6). This veneer partially obscures but does not hide the underlying meander belt topography, which is manifested in the patterns of surface drainage. The loess, correlated with the Peoria loess sheet, represents wind-blown (eolian) silt that was deflated during the last (Late Wisconsinan) glacial stage from valley train (braided stream) surfaces and deposited on the adjacent terraces and uplands (Daniels and Young 1968).

Subsidence and Sea Level Rise

Subsidence and sea level rise are two related basic geologic controls that have affected directly or indirectly virtually every aspect of the geology of south Louisiana during the Quaternary Period. Subsidence is defined as the relative lowering of the land surface with respect to sea level, and it may involve five basic factors or natural processes (Kolb and VanLopik 1958). These include: true or actual sea level rise; sinking or downwarping of the basement (Paleozoic) rocks due to crustal processes; consolidation of the thousands of meters of sediments in the Gulf Basin (geosyncline); local consolidation of nearsurface deposits due to desiccation and compaction; and tectonic activity such as faulting. Since the project area lies beyond the northwestern limit of the zone of major downwarping (Fisk and McFarlan 1955) where the Quaternary sedimentary sequence is relatively thin (but still hundreds of meters thick), downwarping, the consolidation of sediments, and dessication and compaction are relatively minor. Sea level rise has been the dominant control, with tectonic activity being of secondary importance.

Rather than being in the zone of active downwarping, the proposed project area lies near the southern limit of a coast-parallel band that measures several tens of kilometers in width; this area has experienced seaward tilting. The band represents a structural transition between a zone of active uplift to the north and the downwarping into the geosyncline to the south. The actual amount of displacement of the Prairie complex surface in the project area due to tilting has not been established, but probably it is on the order of 3 - 5 m (9.8 - 16.4 ft). The Holocene alluvial sequence to the east of the project area has experienced considerably less displacement due to its young age.

The lithology and stratigraphy of the Pleistocene and Holocene sedimentary sequence of the project area reflect sea level variations that have occurred since the Sangamon stage more than 120,000 years ago. The magnitude and chronology of the variations are known imperfectly, with multiple models having been proposed by various workers based on evidence from both terrestrial and oceanographic sources (Saucier 1994).

A comprehensive discussion of the sea level history of South Louisiana and the northern Gulf Coast is beyond the scope of this study; however, several key events and periods of time

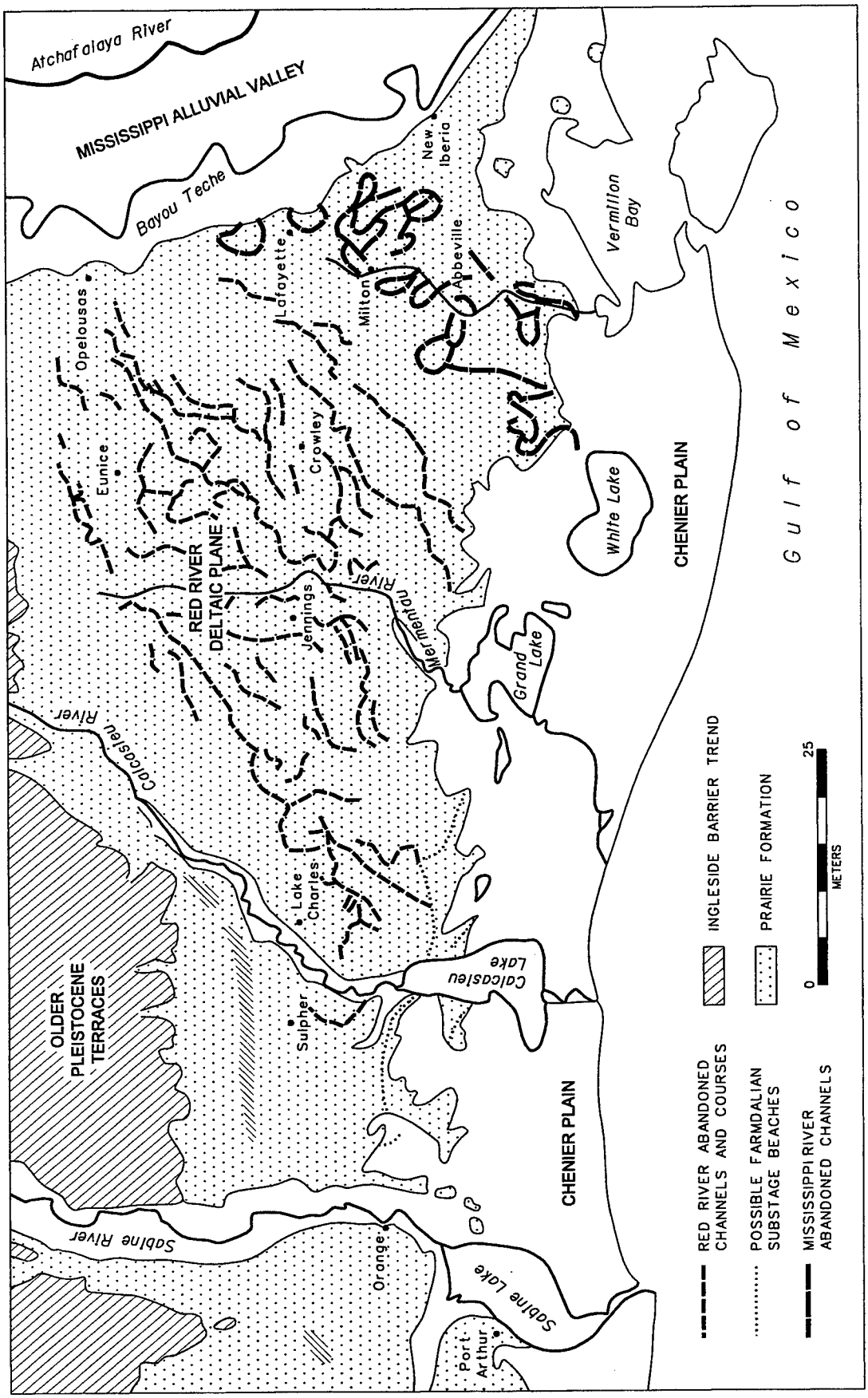


Figure 5. Fluvial and marine features of the Prairie complex of southwestern Louisiana. Lafayette Meander Belt is marked by the complex of Mississippi River abandoned channels trending from Lafayette southwestward toward White Lake. From Saucier 1977.

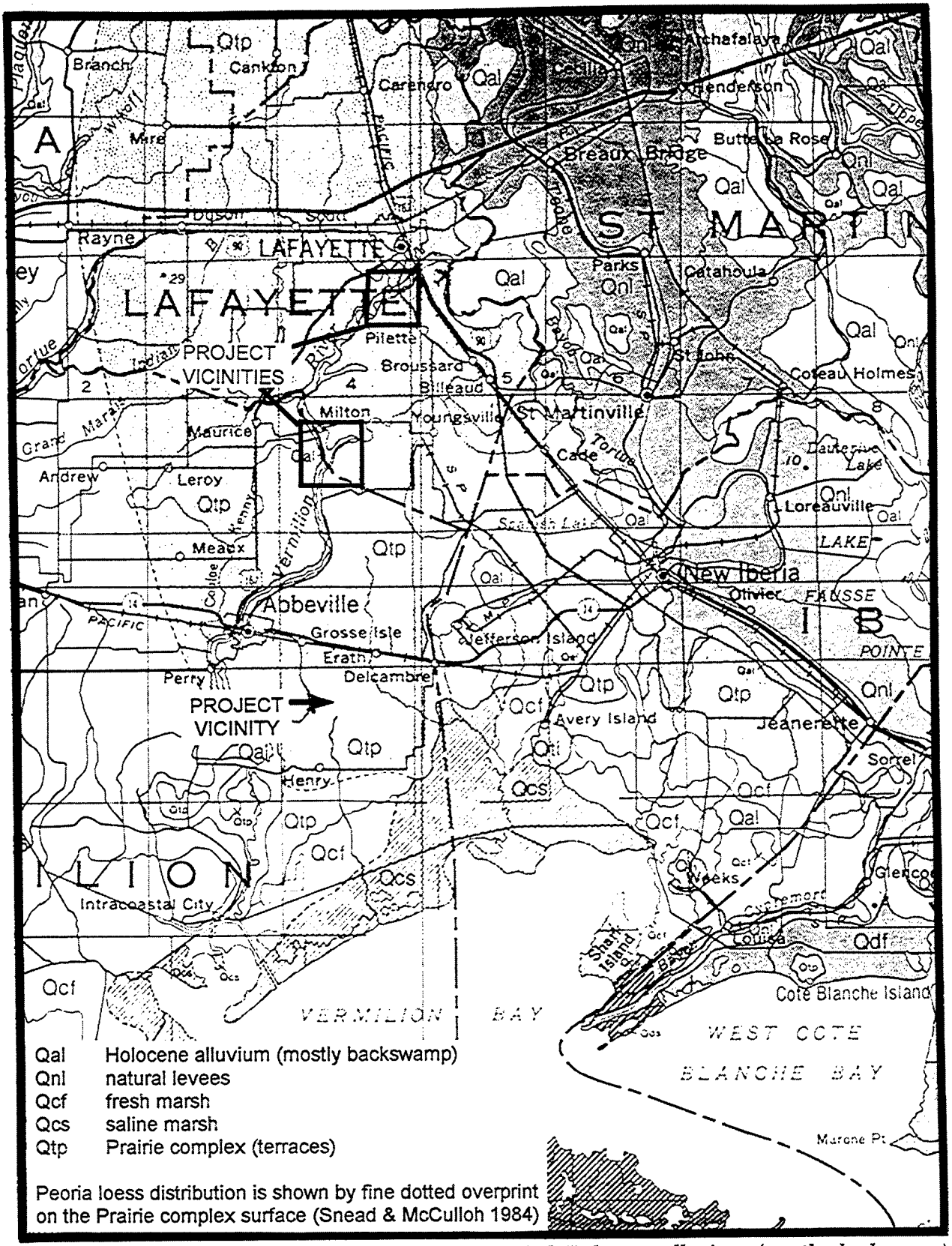


Figure 6. *Geologic map of the project vicinity. Qal=Holocene alluvium (mostly backswamp); Qnl=natural levees; Qcf=fresh marsh; Qcs=saline marsh; Qtp=Prairie complex (terraces). Peoria loess distribution is shown by fine dotted overprint on the Prairie complex surface. From Snead and McCulloh 1984.*

are pertinent to the current review and critical to understanding the evolution of the present landscape. As illustrated in Figure 7, the Sangamon Interglacial Stage was marked by two intervals in which sea level was several meters higher than at present. For at least the following 80,000 years, i.e., during the Eowisconsinan and Early Wisconsin stages when glacial conditions prevailed, the sea level is presumed to have fluctuated by 50 to 60 m (165 to 197 ft), remaining well below the present level. During the brief Middle Wisconsinan Stage, an interval of moderate glacial recession, sea level rose and perhaps attained a maximum elevation of approximately 20 m (65.6 ft) below present levels. Although sea levels during this interval are controversial, some significant events that occurred in the Gulf Coast area indicate an appreciable shallowing of stream gradients and shoreline transgression.

With the onset of the Late Wisconsin glaciation (ca. 30,000 - 20,000 B.P.), which included formation of the Laurentide ice sheet over North America, sea level fell dramatically. During that interval of major stream entrenchment, valley cutting, and shoreline regression, sea level fell to an elevation of about 122 m (400 ft) below present. Subsequently, as glaciation waned, the Holocene transgression took place as sea level rose rapidly but episodically with periods of rise separated by brief stillstands. The highest rates of rise apparently took place at about 12,000 to 10,000 years ago and then began to decline. Sea level attained an elevation only a few meters below that of present by about 5000 B.P., and then it approached slowly its present level by about 3,500 years ago. Since the last 12,000 years or so marks the period of human occupation in the region, landscape formation and geomorphic processes as related to sea level variations are discussed more fully later in this chapter.

The second major factor in regional subsidence has been tectonic activity. Growth faults are known to occur in the overall project vicinity, but none have been identified and mapped that have resulted in displacement of the Prairie complex surface or the Holocene floodplain. The Anse La Butte salt dome, located approximately 50 km (31.1 mi) northeast of the proposed project area, is the most significant diapiric intrusion of the region. Other than the local uplift, however, this geological feature has been of no particular geomorphic significance to the project area.

Landforms, Geomorphic Processes, and Depositional Environments

Following a tradition in the Lower Mississippi Valley of classification and mapping established several decades ago (Kolb et al. 1968), the Holocene alluvial deposits found near the proposed project area have been classified according to the inferred environments in which they developed. This includes the basic environments of fluvial deposition such as abandoned channels and point bars. In the past, Pleistocene terraces have been mapped according to morphostratigraphic units such as the Prairie terrace (e.g., Saucier and Snead 1989; Snead and McCulloh 1984). The Prairie complex in the proposed project area can be subdivided into mapping units that take into consideration the original environments of deposition. These include three units of Pleistocene age they are described and discussed below, their distribution is shown in Figures 8 and 9.

Pleistocene Terrace (Prairie Complex), Point Bar (PTPB)

This mapping unit characterizes a majority of the region. The landscape consists of a relict Mississippi River point bar sequence of alternating, arcuate, linear ridges and swales situated within the Lafayette Meander Belt. The topography, which is level to gently undulating, has been muted by a several-meter-thick veneer of leached Peoria loess of Late Wisconsin age. Original ridge and swale sequences are now more discernible by the numerous, parallel, shallow swales and drainageways rather than by actual relief (Rouly 1989).

The loess consists of massive, tan to light brown or grayish brown silt or silt loam and it is the parent material in which soils have formed. Where the loess is thickest and best drained near the eastern terrace margin, Memphis silt loam and Coteau silt loam are the predominant soil types. Farther to the south and west, Patoutville silt loam soils occur in relatively well drained areas, Frost silt loam soils are found in moderately well-drained situations, and Jeanerette silt loam soils occupy the poorly drained areas. An important aspect of the soil formation process for all of these soils was the presence in prehis-

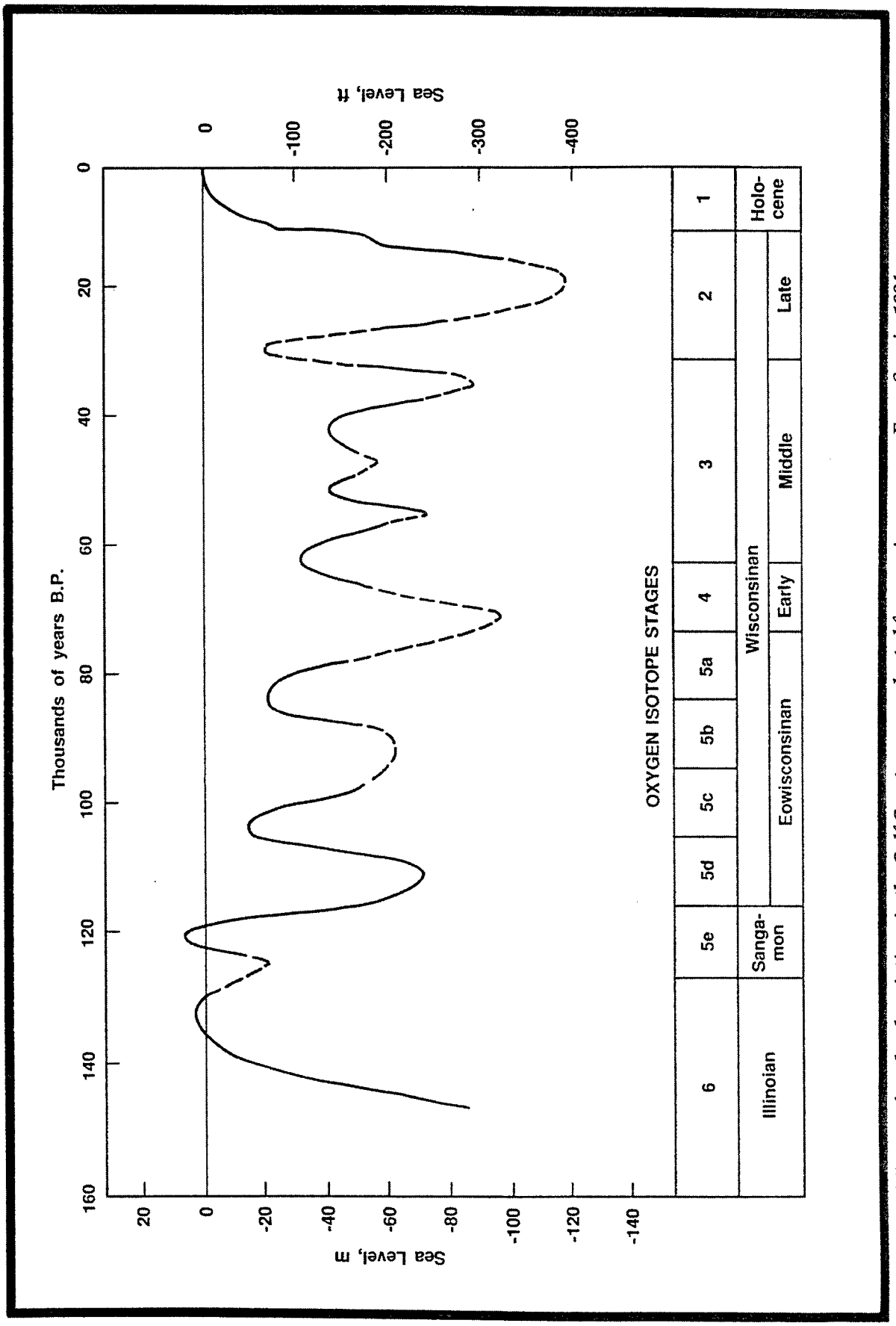


Figure 7. History of sea level variations in the Gulf Coast area as adapted from various sources. From Saucier 1994.

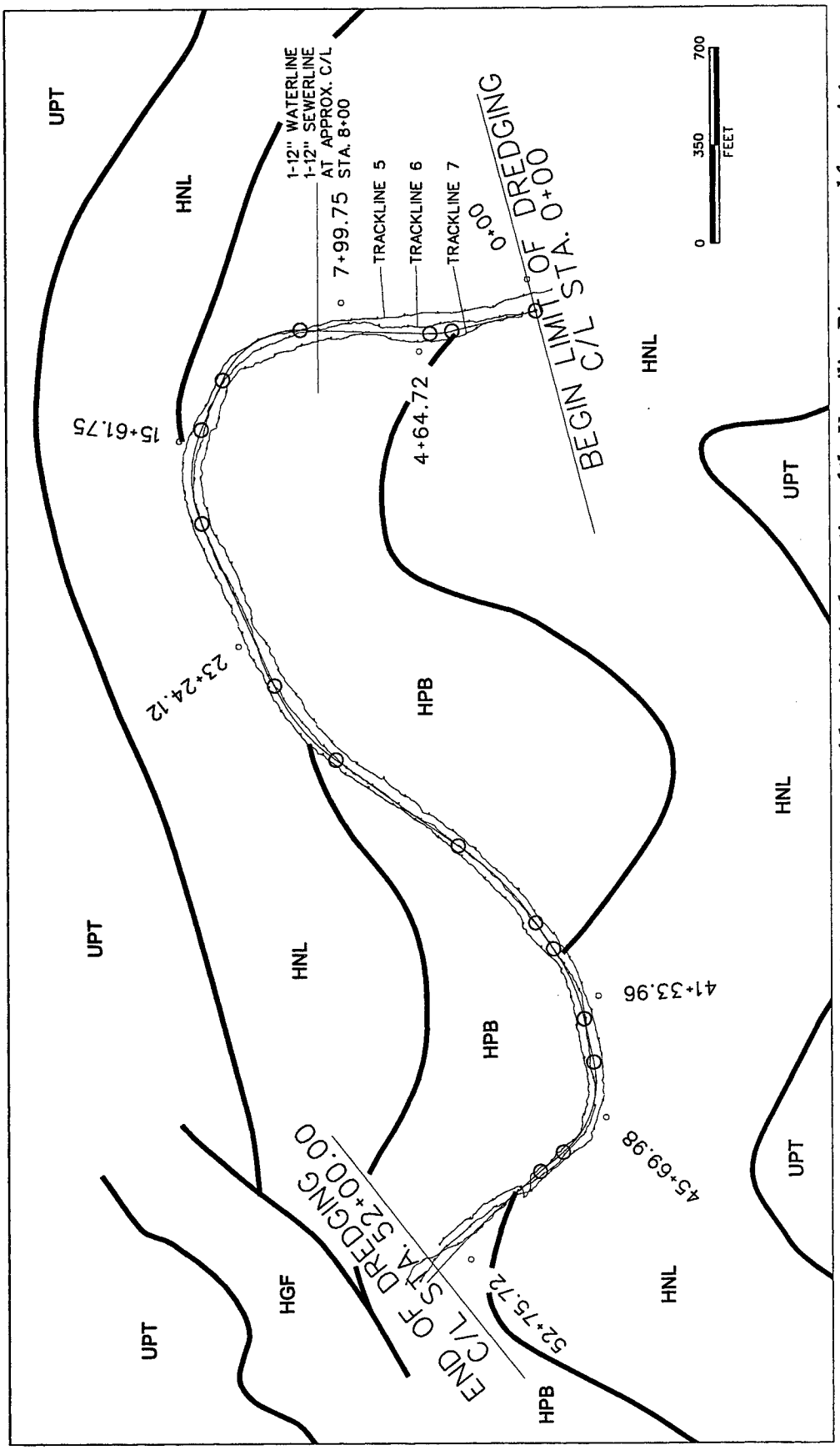


Figure 8. ***Distribution of Pleistocene and Holocene environments of deposition in the portion of the Vermilion River proposed for maintenance dredging. HGF=Holocene Gully Fill; HNL=Holocene Natural Levee; HPB=Holocene Point Bar; UPT=Undifferentiated Pleistocene Terrace.***

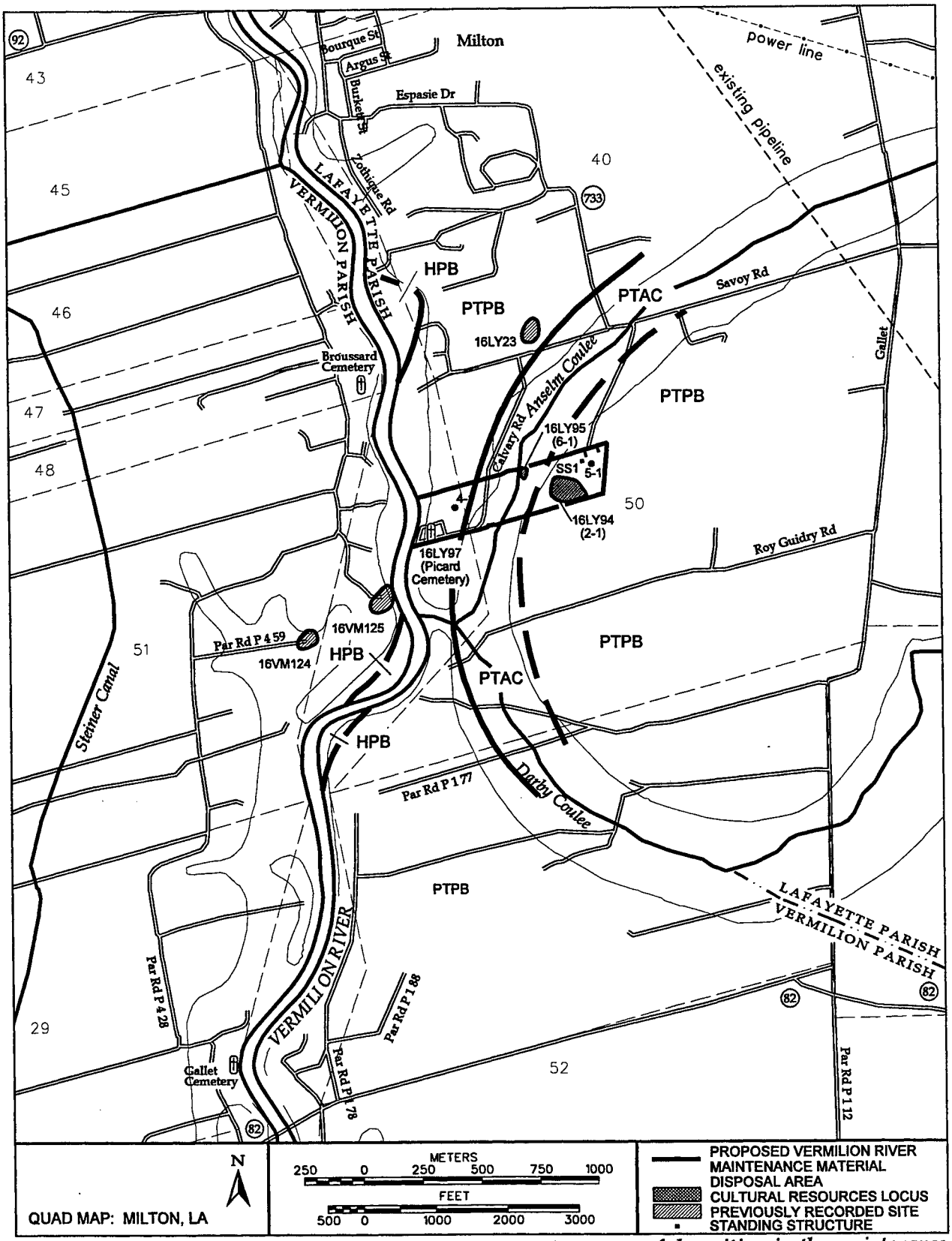


Figure 9. ***Distribution of Pleistocene and Holocene environments of deposition in the maintenance disposal area. HPB=Holocene Point Bar; PTAC=Pleistocene Terrace Abandoned Channel; PTPB=Pleistocene Terrace.***

toric times of prairie grassland vegetation such as big bluestem (*Andropogon gerardii*). Forest vegetation consisting of mixed, deciduous hardwood species such as red maple (*Acer drummondii*), green ash (*Fraxinus pennsylvanica*), redgum (*Liquidambar styraciflua*), water oak (*Quercus nigra*), and cherrybark oak (*Quercus pagoda*) was restricted to narrow bands in the larger swales and along streams.

Little specific information is available regarding the lithology of the point bar topstratum deposits underlying the loess, although logs of subsurface borings or corings potentially are available throughout the region. Based on regional geologic studies, it is safe to assume that they consist of several meters of stiff to hard, highly oxidized, yellowish brown silty and sandy clays with numerous iron and calcareous concretions (VanLopik 1955). These grade downward into progressively sandier deposits and eventually into massive, fine to medium substratum sands and eventually into graveliferous sands. The latter extend to the depth of maximum scour of the Mississippi River channel, which is in excess of 36 m (120 ft).

Pleistocene Terrace (Prairie Complex), Abandoned Channel (PTAC)

As in the modern Mississippi River meander belt, river bends occasionally became isolated from the main channel as a result of neck or chute cutoffs in the Lafayette Meander Belt of the Prairie complex. Upon cutoff, these isolated river segments filled first with a sand wedge and later with thick clays and silts. Oxbow lakes initially existed in the cutoffs, but these eventually became completely or nearly completely filled, leaving only swampy depressions to mark their former locations.

In the general vicinity of the proposed project, all or portions of more than a dozen abandoned channels are apparent both on topographic maps and aerial photos; they have been mapped (with slightly differing interpretations) by a number of geologists (e.g., Fisk 1948; Fisk and McFarlan 1955; Jones et al. 1954; VanLopik 1955) (Figure 5). It is evident that these abandoned channels did not rapidly fill with sediment as normally might be expected. Instead, they were occupied by small, underfit streams that filled the original larger channels with point bar-like deposits. The original banklines of the full-flow channels are difficult to define because of the loess veneer, and the final positions of the underfit stream channels can be mapped as abandoned courses (Saucier 1994). From an archeological perspective, these small streams probably were much more significant to human settlement since they represented perennial sources of water.

The only major abandoned channel in the immediate project area bisects the proposed dredged material disposal area south of Milton (Figure 9). Although its inner bank line is indistinct, the overall feature clearly is evident by the course of Anselm Coulee and the pattern of adjacent point bar ridge and swale topography that is prominent on both topographic maps and aerial photographs.

Pleistocene Terrace (Prairie Complex), Undifferentiated (UPT)

In certain portions of the project area, neither topography nor soils characteristic of point bar deposits and abandoned channels are discernible on maps or aerial photographs. These areas probably represent either point bar areas sufficiently veneered with loess to obscure the original surface morphology, or backswamp (floodbasin) areas situated adjacent to meander belts. In the absence of borings to ascertain the nature of subsurface deposits, they simply have been designated as undifferentiated. Several areas of this type have been mapped near the channel dredging segment of the project (Figure 8).

Holocene Point Bar (HPB)

As will be discussed more fully later, the Vermilion River in the proposed project area is an underfit local drainage feature that, in turn, occupies an abandoned course of the Red River and a Mississippi River distributary that cuts across and is slightly entrenched into the Prairie complex surface. At some time during the Holocene, one or more of these channels migrated laterally enough to create the point bar topography and the underlying deposits. These areas, which are relatively low topographically and which have distinctive soils, have been mapped adjacent to the river channel segment proposed for dredging (Figure 8) where they constitute a majority of the banklines. Some areas also are

present near the proposed maintenance disposal area, but not in the proposed disposal area *per se* (Figure 9).

In the process of meandering that created the point bar areas, some significant volumes of Prairie complex terrace deposits were scoured away and replaced with relatively coarse-grained river channel deposits. The silty and sandy point bar deposits extend to the maximum depth of the migrating channel (perhaps 20 m [65 ft] or more) and are capped with a few meters of fine-grained topstratum deposits. The latter consist of relatively soft, gray to reddish-brown, slightly oxidized clays and clayey silts.

Holocene Natural Levee (HNL)

Streams that carry a moderate to heavy suspended sediment load and that periodically overtop their banks during flooding construct narrow, linear natural levee ridges that are prism-shaped in cross section. The ridges are present on both sides of the river channel and are highest (and thickest) immediately adjacent to the channel. Natural levee deposits typically consist of firm to stiff, well-oxidized, mottled gray and brown or reddish-brown silty clays or clayey silts.

In the proposed channel dredging portion of the project corridor, small natural levees averaging about 150 m (492 ft) are present on both sides of the river landward from and adjacent to the areas of point bar accretion. Some may overlie the older Holocene alluvium, but most appear to overlap the margins of the Pleistocene Prairie terrace complex surface. In this setting, they provide some of the highest elevations in the project vicinity. No natural levees have been identified in the proposed dredged material disposal area situated south of Milton.

Holocene Gully Fill (HGF)

As is typical in much of the blufflands portion of the Prairie complex, the local drainages were incised, thereby creating narrow gullies with relatively steep sides but flat bottoms. This erosion was due to the considerable elevation differential that existed during glacial cycles when sea level was lower than at present and the Holocene Mississippi River floodplain to the east likewise was lower in elevation than at present. The gullies that are present in the channel dredging portion of the project area (Figure 8) were caused by local runoff that flowed into a major gully (stream entrenchment) that later became the route of a Mississippi River distributary, a Red River course, and finally the Vermilion River.

The precise nature of the deposits constituting the gully fill has not been determined, but it probably consists of a heterogeneous mixture of clays, silts, and sands. These represent materials eroded from the adjacent terrace surface and deposited in the gullies by both fluvial and colluvial processes.

Soils

Soils within the proposed dredged material disposal site belong primarily to the Coteau-Frost association; however, loamy udifluvents are mapped both within the Vermilion River (at the proposed dredge area) and the Holocene point bar areas (Murphy et al. 1977). Udifluvents vary in composition from clay loam to loamy fine sand, but they always are found in poorly drained and frequently flooded areas. These udifluvents formed on both natural overbank deposits and where dredged material was deposited in low lying areas. On the adjacent higher Holocene natural levee ridges, soils of the Memphis silt loam series developed. Soils of the Coteau and Frost series were identified on the nearly level to very gently sloping landforms that include stream divides, concave areas, and sideslopes. These soils were formed in the loess veneer that overlies the Prairie complex point bar deposits.

The Coteau-Frost association comprises approximately 27 percent of Lafayette Parish. The association consists of approximately 43 percent Coteau soils and 40 percent Frost soils, with the remaining 17 percent consisting of soils of minor extent (Murphy et al. 1977:8). Coteau soils generally are found on sideslopes, while Frost soils typically occupy lower elevations. Both of these soils are loamy throughout and have a seasonal high water table with a moderate permeability. Each of the two soil recreations is slightly acid at the surface (pH 6.1 - 6.5) but gradually becomes strongly acid (pH 5.1 - 5.5) throughout the middle and lower layers. Minor

soils represented in this association are the well-drained Memphis silt loam and the poorly drained Patoutville silt loam.

Geomorphic History and Chronology

The landform and deposits associated with the proposed project area span a considerable length of geologic time. The following discussion is a basic chronological model adapted from a Lower Mississippi Valley geomorphic synthesis by Saucier (1994). It presents landform and age as related to an understanding of human habitation and settlement patterns in the region.

The initial geologic events relevant to the project vicinity occurred during the Sangamon Interglacial Stage, more than 120,000 years ago (Figure 7). At that time, with sea level a few meters higher than at present, sediments that now constitute the basal part of the Prairie complex were laid down in a shallow water, offshore, marine environment. The Gulf shoreline at that time was several tens of kilometers north of the project corridor.

A sea level regression that was caused by the onset of continental glaciation occurred between about 120,000 and 100,000 years ago. During that time, the shallow offshore area became an emergent coastal plain landscape with stream entrenchment. The Gulf shoreline was located well south of the project area as a result of the regression. Following that regression, there were perhaps two interstadial intervals when sea level rose to within a few tens of meters of its present level, once again submerging parts of the coastal plain and driving the shorelines inland. Those events would have occurred during the Eowisconsinan Stage during Oxygen Isotope Stages 5c and 5a (Figure 7). In neither stage would sea level have risen high enough to submerge the vicinity of the currently proposed project area; however, during either or possibly both, it was sufficiently high to reduce the gradient of the Mississippi River and cause it to aggrade out of an entrenched valley in the older Prairie complex deposits. During one of these stages (ca. 100,000 - 80,000 years ago) it is believed that the Mississippi River aggraded its valley to a sufficiently high level to allow it to form the Lafayette Meander Belt. In doing so, the river incised deeply into the basal Prairie complex marine deposits that had been laid down during the Sangamon Stage.

Abandonment of the Lafayette Meander Belt probably took place during the Early Wisconsin Stage (ca. 80,000 to 60,000 years ago). During that stage, the Mississippi River degraded its valley by at least 40 m (131 ft), created an entrenchment beneath the area of the Atchafalaya Basin, and continued to develop southeastward and off the edge of the continental shelf. In effect, this entrenchment truncated the Lafayette Meander Belt near Lafayette, creating the terrace escarpment approximately where it is today. Abandonment of the Lafayette Meander Belt was not abrupt, however, since declining discharges continued long enough to form the small abandoned courses (underfit streams) that were described above. Since that time, the Lafayette Meander Belt has not experienced any active fluvial deposition.

The next significant regional geomorphic event for which there is stratigraphic evidence probably took place during the moderate sea level transgression of the Middle Wisconsinan Stage (Oxygen Isotope Stage 3c; Figure 7). During that interval of floodplain alluviation and aggradation, it is surmised that the Mississippi River was located somewhere in the central or eastern part of its entrenched valley; however, the Red River created one or more meander belts near the western side of the entrenchment at an elevation slightly higher than the present floodplain but lower than the Prairie complex surface. During this period (ca. 30,000 years ago) the Red River flowed parallel to but west of the Mississippi River, probably discharging directly into the Gulf of Mexico near the present Louisiana coast. Several areas of Red River terrace present west of the project area are believed to be remnants of this floodplain and the underlying deposits but they are not of direct relevance to this discussion.

The Middle Wisconsinan Stage floodplain was abandoned and the Red and Mississippi Rivers began another cycle of valley degradation and entrenchment with the onset of the Late Wisconsin glaciation, i.e., about 25,000 years ago. As the Mississippi River began transporting glacial outwash and forming a sandy valley train through the Atchafalaya Basin area, seasonally strong northerly winds deflated large

quantities of silt and deposited some of it as Peoria loess on the Prairie complex surface. The thickest loess accumulations logically took place closest to the valley train surfaces, which were located east of Lafayette. Loess deposition continued until about 12,000 years ago, i.e., until the effective end of the Laurentide ice sheet meltwater runoff through the Mississippi Valley.

Between about 12,000 and 7,000 years ago, both the Mississippi and Red Rivers were aggrading within the entrenched valley through the accumulation of fine-grained alluvium in a backswamp environment. About 7,000 years ago, the Mississippi River began forming the Maringouin delta complex offshore from the present central Louisiana coast (Frazier 1967). It is known that the trunk course leading to this delta complex was located along the western side of the Atchafalaya Basin in the project vicinity, but at that time it probably was flowing in an anastomosing rather than a meandering regime (Aslan and Autin 1996). However, by about 6,000 years ago, the Mississippi River began constructing the Teche delta complex slightly farther inland in coastal Louisiana and the trunk course leading to this complex is believed to have been in a well-developed meandering regime. Because sea level was still a few meters below its present level, the meander belt in the project vicinity formed at a slightly lower floodplain elevation.

Between 6,000 and 5,000 years ago, sea level rose at a moderate rate to an elevation close to that of the present. Perhaps in response to a consequent and coincident base level change in the project vicinity, the Mississippi River diverted to a new course approximately 60 km (37.3 mi) upstream but still within the same basic meander belt. Thereafter, it rapidly developed the Teche Ridge with its substantial natural levees, crevasses, narrow point bar zones, and flanking backswamp areas. Thus, there is the rather unusual situation of two discrete courses, both with natural levee ridges, occupying essentially the same broad meander belt, but at slightly differing elevations.

With a major stream diversion situated upstream in central Louisiana about 4,800 years ago, Mississippi River discharge through the Teche meander belt started to decline; however, flow apparently did not cease effectively until at least 3,000 years ago. Thus, the Teche Ridge was able to develop to the very substantial proportions that it exhibits today. Sometime during the interval from about 5,500 to 3,000 years ago, probably early in that period, seasonal overflow from the Teche system became impounded in the rimswamp between its meander belt and the Prairie complex to the west. It eventually found an outlet to the southwest across the Prairie complex surface through a series of interconnected cutoffs in the Lafayette Meander Belt and an entrenched local stream (Saxton 1986). Hence, it actually became a minor distributary of the Mississippi River. This event marked the initiation of the channel through which the Vermilion River currently flows, but that river system *per se* did not develop until the channel was at least partially abandoned and later occupied for a short period by a course of the Red River. Archeological evidence indicates that the Red River channel in which the Vermilion River flows had formed and was already abandoned by about 3,000 years ago (during the late Poverty Point to Tchefuncte Periods). After abandoning the Vermilion River route, the Red River is believed to have occupied the recently abandoned Teche course wherein it flowed as an underfit stream for the next 1,000 to 1,500 years. These events only had indirect bearing on the prehistory of the proposed project area in that they indicate that essentially all modern drainage was established by at least 3,000 years ago.

Geoarcheological Considerations

Certain general aspects of culture history provide valuable clues regarding possible prehistoric settlement patterns and landscape relationships of the region. Paleo-Indian and Archaic Period sites, consisting of temporary hunting camps and manifest as lithic scatters, could occur anywhere on the Prairie complex surface, but probably would be concentrated near permanent water sources or rich aquatic habitats that include abandoned channels. It already is known that the prairies in the vicinity of the proposed project area were frequented by Pleistocene megafauna (Gagliano 1964; Gibson and Miller 1973; Neuman 1984; see also Chapter III) and the scattered wooded tracts would have provided excellent cover for hunters.

During the Formative Stage, the probability of human occupation decreases even further because the landscape of the area would not

have been attractive to a population that based its subsistence on intensive hunting and gathering or agriculture. Despite the water courses of the proposed project area (the Vermilion River and Anselm Coulee), the prairie habitats would not have been nearly as conducive to settlement as larger, relatively nearby floodplain areas associated with the Mississippi River alluvial plain to the east. After 5,000 years ago, environmental conditions in the abandoned channel area would have shifted the focus of habitability to areas like the natural levees flanking the Red River course in which the Vermilion River is located.

In general terms, most of the landscapes in or adjacent to the two project segments are sufficiently old that they may have witnessed prehistoric human activity, but other factors must be considered in evaluating the specific probability of encountering preserved remains. The proposed chronological model for the project vicinity indicates that no buried or surficial prehistoric cultural remains are likely to be present in the Vermilion River channel where the dredging is proposed. Any aboriginal settlements older than about 5,000 years have been destroyed by the vertical scouring and/or lateral migration of the Red River and possibly by the earlier Mississippi River distributary. After about 3,000 years ago, the immediate river channel and banks would not have been an environmental setting conducive to settlement because of low elevations and the possibility of occasional flooding.

In contrast, habitation sites of any prehistoric age could be present on the Prairie complex surface in the western one-third and the eastern one-third of the proposed dredged material disposal area. These areas are located adjacent to the Pleistocene abandoned channel now occupied by Anselm Coulee. The surface would have been relatively immune from flooding, a permanent water source (the Vermilion River or earlier streams) would have been nearby, and the abandoned channel would have provided an environment rich in floral and faunal resources. While archeological sites could be present, their probable regional density, based on the results of other surveys in the region, is such that the probability of a site being located in the project area is extremely low. Moreover, while possibilities exist throughout the proposed dredged material disposal site for archeological site stratification, these possibilities have been diminished greatly in those areas where mechanical impacts such as construction or deep plowing associated with modern agriculture and land use have been practiced. The probability of site stratification also has been reduced by natural erosion along the terraces slopes found throughout the area.

Once again, considering the portion of the Vermilion River channel to be dredged, it is theoretically possible that sites dating from the Paleo-Indian, Early Archaic, and Middle Archaic Periods could be present and preserved on the Prairie complex surface where it is buried by a thin veneer of Holocene natural levee deposits. Only a small part of the river channel is flanked by this stratigraphic sequence and, provided that the dredging would not widen the channel and involve previously undisturbed deposits, these areas should be of no consequence to the proposed dredging activities. There is an extremely remote possibility that sites could have existed at the top of the original bank and slumped into the river channel after abandonment by the Red River, but the cultural remains would be badly disturbed and unlikely to constitute a "significant" site.

Flora

The Prairie complex surface (Coastal Prairies Area) is distinguished by being relatively treeless. The major plant species common to this area are little bluestem, yellow Indian grass, and big bluestem (*Andropogon gerardii*). Seacoast bluestem, eastern gama grass, gulf muhly (*Muhlenbergia capillaris*), vetches (Fabaceae), milkweeds (*Asclepias* sp.), spiderwort (Commelinaceae), compass-plant (*Lactuca* sp.), chenopods (*Chenopodium* sp.), and amaranths (*Amaranthus* sp.) are additional forbs found in the region. Bison (*Bos bison*) have been associated with the Tall Grass region; however, it is unclear if bison were in these prairies prior to A.D. 1200.

The proposed project area is located both in and adjacent to the Vermilion River; in addition, the proposed dredged material disposal area is bisected by Anselm Coulee. Historically, the major rivers and streams of the Prairie complex have comprised an oak-pine region that approximates the bottomland communities found throughout the southeast. This area is characterized by a wide range of oak (*Quercus* sp.) and

hickory (*Carya* sp.) species with shortleaf (*Pinus echinata*) and loblolly (*pinus taeda*) pines in the drier uplands. Other common trees include willow (Salicaceae), basswood (*Tilia* sp.), hack/sugarberry (*Celtis* sp.), black walnut (*Juglans nigra*), locusts (*Robinia* sp.), elms (*Ulmus* sp.), cottonwood (*Populus* sp.), birch (*Betula* sp.), magnolia (Magnoliacaea), maples (*Acer* sp.), and gums (*Liquidambar*). The understory typically is dominated by shrubby species including persimmons (*Diospora virginiana*), hawthorn (*Crataegus* sp.), sassafras (*Sassafras albidum*), hollies (*Ilex* sp.), pawpaw (*Asimina triloba*), mulberry (*Morus* sp.), and redbud (*Cercis canadensis*). Several vining species, e.g., grapes (*Vitis* sp.), and catbriars (*Smilax* sp.) are associated with open portions of this forest type. Due to the rich diversity of mast and fruit producing species found in the oak-pine region, "it is reasonable to expect that higher animal densities could be supported than in the pine dominated region" (Story 1990a:15). It is probable that the Native Americans would have focused their subsistence efforts on this region due to the variety of plants and animals associated with it.

Ethnographic and Paleoethnobotanical Evidence of Plant Use

The ethnographic and paleoethnobotanical records reveal the importance of wild plants to the residents of southwestern Louisiana. A lack of paleoethnobotanical evidence from the vicinity of the proposed dredge corridor prohibits an estimation of the importance of agriculture to the local populations. There is evidence, however, that Native Americans inhabiting the vicinity of the proposed dredged material disposal area practiced little or no horticulture until very late in prehistory (Story 1990b; Swanton 1942, 1979; see also Chapter III). The distribution and importance of wild plant species is discussed below in relation to ethnographic and paleoethnobotanical evidence for these species.

Among the most important plant resources used by prehistoric groups in southeastern North America were nuts. Of major importance were hickory nuts (both thin and thick-shelled varieties) and acorns. Oak and hickory trees are scattered throughout the oak-pine region along major waterways. The ripening of these nuts in the late fall would have attracted not only humans to these forests but also animals such as deer, bear, and squirrels. Humans would have had to compete with these animals for the nut crops, but the close contact between humans and animals also would have presented excellent hunting opportunities.

Hickory nuts were an important source of oil and protein for the prehistoric Woodland populations. Indeed, hickory nutshell represented a large part of the paleoethnobotanical assemblages throughout prehistory (Asch and Asch 1985; Chapman and Shea 1981; Crane 1988; Johannessen 1984; King 1984; Perttula and Bruseth 1981, 1983). Hickory nuts probably were used in the form of "hickory milk". To produce hickory milk, unshelled hickory nuts were pulverized and boiled in water to produce a rich milky liquid with a high oil and protein content (Swanton 1979:273). Hickory nutmeats, especially those of thin-shelled hickories such as pecans, were sometimes ground and added to breads (Swanton 1979:272).

At Contact, Native Americans were using acorns for a variety of subsistence related purposes. Ethnographic accounts describe groups leaching acorn nutmeats in water, sometimes with ashes, to remove the bitter tannins (Densmore 1974; Gilmore 1977). The leached nutmeats then were ground and used as flour for making bread (Gilmore 1977; Swanton 1979:273, 279). Oil from the acorn was used for cooking and for personal adornment (Swanton 1979:277). Evidence of acorn use exists throughout much of the Southeast from the Archaic Period to Contact (Caddell 1983; Chapman and Shea 1981; Crane 1988; King 1984; Lopinot 1984; Perttula and Bruseth 1981, 1983; Scarry 1986). However, acorn nutshell tends to be much less common than hickory nutshell. The low rate of occurrence may be because acorn nutshell breaks into smaller pieces when compared to hickory, rather than to a significantly lower rate of acorn use.

Mast bearing species such as black walnut, hazelnut, and beechnut probably were used by local Native American groups but to a much lesser extent than acorns and hickories. It is difficult to estimate why these nuts were not more important. One possibility is that only hickories and oaks produce sufficient predictable masts to support extensive exploitation.

Other significant wild plant resources utilized by residents of the proposed project area

environs included fruits. Farther to the north, i.e., in Management Unit I (Smith et al. 1983), there are ethnographic reports of Caddoan groups having orchards of native plums (*Prunus* sp.) and persimmons, along with European peaches (Roseacae), figs (Moraceae), and pomegranates (Punicaceae) (Swanton 1942). Wild and nonarboreal sources of fruit also were collected. Wild plums, cherries (Roseacae), sugar/hackberries, persimmons, pawpaw, hawthorn (Roseaceae), sumacs (*Rhus* sp.) and other arboreal fruits would have been found scattered in the open areas beside the waterways running through the rich deciduous forests of this oak-pine region. The seeds from these arboreal fruits are quite common at southeastern archeological sites (Crane 1982, 1988; Cutler and Blake 1973; King 1984; Perttula and Bruseth 1981, 1983; Scarry 1986; Story 1990b). Early European explorers noted that persimmon fruits often were dried and stored by Native Americans (Swanton 1979: 363, 373). The fresh persimmons were sieved to remove the seeds, or simply pulverized, then dried to form a cake. These persimmon cakes served as a source of starch and sugar during the winter months.

Vining fruits native to the current project area vicinity include maypops (*Passiflora incarnata*), brambles, and several species of grapes. These fruits also could have been collected, dried, and stored for later use. As with the arboreal fruits, the vining fruits would have been most common in the oak-pine region, although they could be found scattered in other regions.

Unlike many of the arboreal and vining wild subsistence plants, those plants collected for their roots would have been more common in semi-aquatic and grassland environments. Locally abundant semi-aquatic species such as arrowroot (Taccaceae), American lotus (Nelumbonaceae), and cattail (*Typha lattifola*) would have been collected for their rich starchy roots (King 1984). Numerous species of tuberous plants are associated with the prairie environments, such as the Tall Grass region (Kindscher 1987). Among these plants are wild onion (*Allium* sp.), and bush morning glory (*Ipomea pandurata*). Groundnut (*Apios americana*), wood sorrel (*Oxalis stricta*), and catbriars occur in woodlands, but the roots of those plants also were collected by Native American groups.

Wild grains and pulses were collected (and possibly cultivated) by southeastern Native Americans (Kindscher 1987). The greatest natural concentration of these plants would be in open areas. Some of the plants whose seeds were collected and processed as grains or pulses included chenopods, sunflower (*Helianthus* sp.), amaranths, vetches, sumpweed (*Iva annua*), knotweed (*Polygonum* sp.), sedges, and wild bean (Fabaceae) (Crane 1982, 1988; Perttula and Bruseth 1981). The use of these wild grains is supported by early historic descriptions of Native Americans collecting "seeds of reeds" (Swanton 1942:134). In addition, specific species of chenopods, amaranths, sumpweed, sunflower, and knotweed were encouraged or cultivated by prehistoric farmers in the Midwest (Smith 1992).

Fauna

Lafayette Parish has a total land area of 181,120 ac (73,299 ha) and in 1972 approximately 77 percent of that area was dedicated to some form of crop cultivation. Since that time, however, there has been a steady decline in agricultural acreage due to urban expansion. Woodland areas have been reduced to 4500 ac (1821 ha), and although some of this is scattered about in small blocks throughout the parish, it principally is located in the eastern portion of the parish. These modifications to the natural environment have resulted in a loss of suitable wildlife habitat causing a reduction in diversity and population of the local fauna and flora (Murphy et al. 1977).

The largest populations of wild game animals and birds are those associated with openlands. Some of these are: Eastern cottontail rabbit; (*Sylvilagus floridanus*); doves, such as the mourning dove *(Zenaida macroura)* and rock dove (*Columba livia*); bobwhite quail (*Colinus virginianus*), and the common snipe (*Capella gallinago).* Rice is a dietary favorite of the dove and many are seen around the harvested rice fields of the Lafayette area. The common snipe, whose population is influenced by rainfall patterns, is commonly seen around the flooded rice fields. Urban sprawl and high agricultural usage has led to a loss of suitable habitats for many faunal species; however, the low ground cover protection provided by underbrush and sugarcane

crops has allowed the bobwhite quail and the cottontail rabbit to maintain average populations (Smith 1977:28).

White-tailed deer (*Odocoileus virginianus*), Eastern gray squirrel (*Sciurus carolinensis*), fox squirrel (*Sciurus niger*), swamp rabbit (*Sylvilagus aquaticus*), wood duck (*Aix sponsa*), and the American woodcock (*Philohela minor*) are all woodland game whose habitat has shrunk with the decline of woodland acreage. Small fur-bearing mammals such as muskrat (*Ondatra zibethicus*), mink (*Mustela vison*), otter (*Lutra canadensis*), and nutria (*Myocastor coypus*) have been reduced in number due to the same lack of suitable habitat (Smith 1977:28).

The spotted salamander (*Ambystoma maculatum*), tiger salamander (*Ambystoma tigrinum*), Eastern spadefoot (*Scaphiopus holbrooki*), bullfrog (*Rama catesbeiana*), southern toad (*Bufo terrestris*), American toad (*Bufo americanus*), spring peeper (*Hyla crucifer*), chorus frog (*Pseudacris triseriata*), gray tree frog (*Hyla versicolor*), and green tree frog (*Hyla cinerea*) are amphibians common to the parish. The eastern fence lizard (*Sceloporus undulatus*), ground skink (*Scincella lateralis*), five-lined skink (*Eumeces fasciatus*), and slender glass lizard (*Ophisaurus attenuatus*) are examples of lizards found in the project area. Colubrid snakes are represented by racer (*Coluber constrictor*), eastern hognose (*Heterodon platyrhinos*), mud snake (*Farancia abacura*), smooth green snake (*Opheodrys vernalis*), brown snake (*Storeria dekayi*), and common king snake (*Lampropeltis getulus*). Some examples of the poisonous snakes or pit vipers common to the area include copperhead (*Agkistrodon contortrix*), cottonmouth (*Agkistrodon piscivorus*), Eastern diamondback rattlesnake (*Crotalus adamanteus*), and the timber rattlesnake (*Crotalus horridus*). The alligator (*Alligator mississippiensis*) is another reptile that can be seen throughout the project area (Gibson 1975:30-31).

The faunal populations have suffered from the effects of civilization. Urban spread has reduced the areas for suitable faunal habitats. Pollution of the lakes, streams and rivers has reduced the fish population. Several faunal species are recognized by both federal and state agencies as threatened with the possibility of extinction. The Louisiana Black Bear is a threatened species and it will likely join the growing list of animals endangered of extinction. The Eastern diamond-backed rattlesnake also is considered extremely rare in Louisiana. Both state and federal agencies consider many of the migratory and stationary bird species to be threatened or endangered of extinction. Some these are the glossy ibis (*Plegodis falcinellus*), the golden eagle (*Aquila chrysaetos*), the bald eagle (*Haliaeetus leucocephalus*), the interior least tern (*Sterna anrtillarum athalassos*), the caspian tern (*Sterna caspia*), the gull-billed tern (*Sterna nilotica*), and the sooty tern (*Sterna fuscata*) (Louisiana Department of Wildlife and Fisheries 1997).

Ethnographic and Zooarcheological Evidence of Animal Use

Mammals, birds, reptiles, amphibians, and fish all were used by the prehistoric and historic inhabitants of the proposed project vicinity. While no reports of zooarcheological collections were found for the immediate area, information on regional and extra-regional patterns of faunal exploitation was available (Dillehay 1975; Perttula and Bruseth 1981, 1983; Story 1990b; Styles and Purdue 1984). In addition, Swanton (1942, 1979) summarizes ethnographic and ethnohistoric reports on the Chitimacha and other southeastern Native American groups (see Chapter III). Ethnographic accounts suggest that wildlife diversity and numbers were abundant. Native Americans relied on the local wildlife not only for food, but also for the materials that could be processed for non-food items (Swanton 1946).

Most of the mammals significant to Native American subsistence inhabit the margins of forests and rivers. The principal mammals identified in the zooarcheological record are white-tailed deer (*Odocoilius virginianaus*), rabbit (swamp and cottontail) (*Sylvilagus* sp.), opossum (*didelphis virginana*), squirrel (gray and fox) (*Sciurus* sp.), raccoon (*Procyon lotor*), and pocket gopher (*Geomys* sp.) (Perttula and Bruseth 1981, 1983; Styles and Purdue 1984). Mink (*Mustela vison*) and bear (*Ursus americanus*) remains also occasionally are identified (Styles and Purdue 1984). The patterns of mammalian exploitation are quite similar to those described in the ethnographic record. Deer, rabbit, bear, and buffalo (North American bison) all represent mammals hunted by historic groups populating the area (Swanton 1979).

All of the mammals discussed above would have been used for a variety of purposes

(Swanton 1979). The major use of the animals would have been as a source of meat. Mammals, especially white-tailed deer, were a vital source of raw materials such as hides for clothing and bones for tools. Bear, buffalo, and to a limited extent white-tailed deer, were used as a source of fat. Bear fat especially was prized since it could be rendered and stored for later use.

Bison remains have not been found commonly in zooarcheological collections from this region. There may be several explanations for this lack of buffalo remains given the importance of this species to the historic Caddoan groups located in north Louisiana (Dillehay 1975; Swanton 1942). First, large herds of buffalo probably did not migrate into the Southeast prior to A.D. 1200. As a result, the use of this species would be limited until late in prehistory. Second, if bison hunts occurred at some distance from settlements, perhaps only the processed meat would have been brought back from the hunting locales. This procedure would have limited the amount of bison bone found at habitation sites. Finally, the addition of horses during late prehistory may have increased the importance of bison hunting for those groups at prairie margins just prior to contact with the Europeans.

Avian species were another source of protein and technological material for Native Americans. Ethnographic accounts and the archeological record suggests that wild turkey was the most important avian resource utilized throughout the broader region (Perttula and Bruseth 1981; Story 1990b; Styles and Purdue 1984; Swanton 1942, 1979). Indeed, wild turkeys were the most commonly utilized avian species found at Caddoan sites excavated in southeastern Texas. Other woodland birds that have been identified at these archeological sites include bobwhite quail, owls, woodpeckers, crows, hawks, and bald eagles. The flesh of these species may have been consumed, and the feathers and bones were utilized in tool manufacturing. There are relatively few migratory or residential waterfowl found at archeological sites in the area despite historic descriptions of the importance of these waterfowl (Swanton 1942). Within the vicinity of the project area, turkey and bobwhite quail would have been attracted to the heavy mast production. Raptors and scavengers, however, prefer a more open canopy than the woodland species, and they may have clustered near forest margins.

Various reptile and amphibian species undoubtedly were collected/hunted by the historic and prehistoric residents of the proposed project area. Box turtles commonly are found in southern Caddoan zooarcheological collections (Perttula and Bruseth 1981, 1983; Story 1990b; Styles and Purdue 1984). In addition, aquatic turtle species such as snapping turtles, sliders, stinkpots, and soft shell turtles also are associated with some of these collections (Perttula and Bruseth 1981, 1983). Alligator remains rarely are identified in these samples, but it is likely that alligators were hunted in local swamps and waterways, because ethnographic accounts reveal the importance of alligators to the Southeastern Native American groups (Swanton 1942, 1979). Amphibian species such as frogs and toads probably were collected, but the delicate nature of their bones makes zooarcheological recovery difficult.

The importance of aquatic resources to the Native Americans in the region is revealed in the quantity of fish bone recovered from sites and in the ethnographic accounts of fishing techniques practiced in the region. Important game fish include bowfin, gar, sucker, pickerel, catfish, bass, sunfish, and freshwater drum. Historic Southeastern Native American fishing techniques included poisoning, spearing, and using hook and line and trotlines (Swanton 1979).

Climate

Southwest Louisiana is characterized by a humid subtropical climate. Summers are long, hot, and rainy, but winters generally are mild and pleasant. Average annual precipitation is 145 cm (57 in), of which over half (79.3 cm [31.2 in]) falls during the April through September growing season. Local weather patterns are controlled primarily by prevailing southeasterly winds blowing from the Gulf of Mexico. These winds average about 25 km per hour (10 mi per hour) during the spring and assist in the formation of localized afternoon thundershowers, which are common throughout the spring and summer months. The summer and autumn months also are subject to occasional tropical storms or hurricanes, which threaten the area every few years and can cause extremely heavy rains for one to three days. During the winter, cool fronts from the north usually are weakened

or completely dissipate before reaching south Louisiana.

Based on data recorded from 1941 to 1970 in Lafayette Parish, the daily average temperature peaks in July and August at 27.5° C (81.5° F), with an average maximum temperature of 33° C (91° F) (Muller 1977). Temperatures only occasionally exceed 38° C (100° F). Summer nighttime temperatures drop to about 21.8° C (71.3° F). July also is the rainiest month, averaging 17.8 cm (7 in) of precipitation, although 32.3 cm (12.7 in) of rain may fall during the month in one of every 10 years (Muller 1977). The winter temperature averages about 12.1° C (53.7° F), and it may reach freezing 0° C (32° F) from late November through mid-March, although this usually occurs only after nightfall.

CHAPTER III

PREHISTORIC SETTING

The proposed Vermilion River Dredge Maintenance Project area is located on the Gulf Coastal Plain. This region of prairie terraces is characterized by meandering rivers that serve as a buffer between the swampy lowlands to the south, and the piney woods to the north. The proposed project area is divided into a terrestrial and a maritime component (Figure 1).

The proposed project area is located within Management Unit III as defined by *Louisiana's Comprehensive Archaeological Plan* (Smith et al. 1983). In his annual summary for this unit, regional archeologist Charles McGimsey (1997) presents Lafayette and Vermilion Parishes as two of 13 southwest and south central Louisiana parishes (Acadia, Allen, Beauregard, Calcasieu, Cameron, Evangeline, Iberia, Jefferson Davis, Lafayette, St. Landry, St. Martin, St. Mary, and Vermilion) encompassed by the management unit. The project area lies within the Southeastern Culture Area of the United States (Muller 1983); as a result, cultural characteristics found within the proposed project area vicinity resemble those manifested in the Lower Mississippi Valley and along the northern coast of the Gulf of Mexico, as well as other parts of the region.

The prehistory of Management Unit III extends from ca. 12,000 B.C. - A.D. 1700 and can be divided into four general archeological stages. These four stages (Paleo-Indian, Archaic, Woodland, and Mississippian) are developmental segments characterized by dominant patterns of subsistence and technology (Kreiger 1953; Willey and Phillips 1958). Each stage consists of a sequence of chronologically defined periods, which may be sub-divided into phases based on sets of artifacts and other cultural traits characteristic of a particular geographic region (e.g., Jenkins 1979; Walthall 1980). While different systems have been used over the years to organize and describe the culture history of the region (e.g., the Paleo-Indian, Meso-Indian, and Neo-Indian eras used by Neuman 1984), the syncratic stage-period-phase system described by Willey and Phillips (1958) and subsequently examined by Jenkins and Krause (1986) will be utilized in the discussion presented below.

In recent years, eight major cultural units have been used to describe the prehistoric sequence of this management unit: Paleo-Indian, Archaic, Poverty Point, Tchefuncte, Marksville, Troyville-Coles Creek, Plaquemine, and Mississippian (Jeter et al. 1989; Smith et al. 1983). Research by Kidder (1988) suggests that Plaquemine Culture actually represents a variant phase of the Emergent Mississippian Period, and it will be discussed as such. Constant refinements in the comparative or actual dating of artifacts, as well as in the assignment of cultural periods, phases, and horizons throughout the Southeast, have documented both the temporal and spatial overlap of material traits and lifeways. They suggest varying degrees of cultural diffusion and invention, as well as technological persistence among indigenous populations. Therefore, overlapping dates may be found throughout this review.

Paleo-Indian Stage (ca. 10,000 - 6000 B.C.)

Initial human occupation of the southeastern United States generally is believed to have occurred sometime between 10,000 and 12,000 years ago (8000 - 10,000 B.C.). Paleo-Indian sites are

characterized by a distinctive assemblage of lithic tools that includes fluted and unfluted lanceolate projectile points/knives, unifacial end and side scrapers, gravers, and spokeshaves. Paleo-Indian lithic technology displays a high level of workmanship, and chipped stone artifacts of the period exhibit fine flaking, edge grinding, retouching, and basal thinning (Neuman 1984; Smith et al. 1983).

The earliest Paleo-Indian culture identified in North America has been named "Clovis," after the type-site identified in the southwestern United States. In the western United States, Clovis sites appear to fall within a relatively narrow time range, i.e., between 10,900 and 11,500 years ago (9550 - 8950 B.C.) (Haynes 1991; Story et al. 1990:178). While the evidence for earlier "pre-Clovis" or "pre-projectile point" occupations continues to be debated (Chrisman et al. 1996), no earlier sites have been documented convincingly in North America. The lithic tool assemblage of the Clovis Culture, and the Folsom Culture of the Great Plains and Southern Plains, generally is referred to as the Llano complex. The smaller, fluted Folsom and unfluted Midland projectile points/knives once were thought to postdate Clovis; however, accepted radiocarbon dating of numerous Folsom components in Texas produced dates ranging from ca. 9050 - 8050 B.C. (Largent et al. 1991:323-332; Story et al. 1990:189). These dates suggest that Folsom Culture may be partially contemporaneous with the Clovis Culture.

The Plano complex represents a similar tradition in the Southern Plains. In East Texas and Louisiana, this complex is represented by unfluted lanceolate Plainview, Firstview, Hell Gap, and Angostura projectile points/knives. These types first were thought to be unfluted variants of the Clovis type, but radiocarbon dating suggests a later temporal placement. Current data place the Plano complex in the period from 8150 - 6050 B.C. (Turner and Hester 1985:66, 141). Artifacts in the Plano style have been found throughout Louisiana (e.g., Cantley et al. 1984; Hillman 1990:206-207). Gagliano (1963:12) recovered a single Plainview projectile point/knife from Jones Creek (Palmer Site - 16EBR26) near Baton Rouge.

Another Paleo-Indian tradition identified in North America is the Cody complex. This assemblage includes the stemmed lanceolate Scottsbluff and Eden projectile points/knives. Cody complex bifacial tools usually are identifiable by the presence of fine comedial pressure flaking. The uplands in the Texarkana region of northwest Louisiana, northeast Texas, and southern Arkansas have produced relatively large numbers of Cody Complex artifacts (Gagliano and Gregory 1965:62-77; Story et al. 1990:209), but the associated radiocarbon (^{14}C) dates have not been conclusive. These ^{14}C dates range from 8200 - 7150 B.C. (Story et al. 1990:209), although Turner and Hester (1985:149) place the Scottsbluff projectile point/knife at ca. 7120 - 6650 B.C.

Paleo-Indian peoples are thought to have been highly mobile hunter-gatherers, organized in small bands or extended family groups. The formerly prevalent notion that the Paleo-Indian populations were specialized big game hunters seems less tenable as information becomes available from a more inclusive set of Paleo-Indian sites. While sufficient evidence exists for the exploitation of large mammals (mega-fauna) including mammoth, mastodon, bison, caribou, and elk at sites in the western and northern United States, kill sites are rare in the Southeast. The occurrence of Clovis-like fluted projectile points/knives in the southeastern United States is thought to reflect contemporaneity with a culture similar to the Clovis sites recorded in the western and northern parts of the country. Whether or not this suggests that big game hunting was a dominant adaptive strategy in the Southeast is less certain because of the regional environmental differences associated with the availability of the big game species. For example, excavations at the Kimmswick Site in southeastern Missouri produced Clovis projectile points in direct association with disarticulated mastodon bones, suggesting that Southeastern Paleo-Indian populations did exploit large Pleistocene mammals at least occasionally (Graham et al. 1981). In contrast, two locations in south central Louisiana, Avery Island (Salt Mine Valley; 16IB3) and the Trappey Mastodon Site (16LY63) in Lafayette, produced the remains of Pleistocene fauna, but failed to provide a Paleo-Indian relationship (Gagliano 1964; Gibson and Miller 1973; Neuman 1984).

Although there are few data upon which to base a dietary reconstruction, Paleo-Indian subsistence throughout the Southeast, including the vicinity of the current proposed project, is be-

lieved to have encompassed a broad spectrum of resources, including fish, fowl, deer, small mammals, nuts, and gathered plants (Smith 1986:9-10; Steponaitis 1986:369; Walthall 1980:36). The exception may be the Folsom Culture. Folsom artifacts have been associated consistently with bison kill sites on the Great Plains. The lack of faunal evidence in association with Folsom finds in east Texas and Louisiana, due mainly to the highly acidic nature of the soils and the moist climate, precludes insight into the subsistence strategies of the area. Indications are that the Folsom Culture could represent an adaptation to a specialized hunting strategy associated with the cyclical migration of large herds of bison (Story et al. 1990:189).

Most of the archeological evidence associated with the Paleo-Indian occupation of the southeastern United States is limited to surface finds of diagnostic projectile points/knives (Mason 1962). In the Lower Mississippi Valley, Paleo-Indian projectile points/knives have been recovered along valley margins but only occasionally in the alluvial valley or along the coastal plain, and distribution studies indicate that Paleo-Indian sites in the eastern United States tend to be located on eroded terrace and plateau surfaces (Walthall 1980). Paleo-Indian and Early Archaic presence in the Lower Mississippi Valley is best documented from Maçon Ridge, a relict Pleistocene braided plain in Northeast Louisiana (Saucier 1981). Hillman (1985, 1990) collected information concerning 121 sites on the Maçon Ridge from which over a thousand Paleo-Indian and "epipaleoindian" (Gibson 1982) projectile points/knives have been collected, including 272 Dalton-Meserve, 39 Hardin, and over 400 San Patrice types. He concluded that Early and Middle Paleo-Indian occupation of Maçon Ridge apparently was sporadic or seasonal, possibly reflecting the somewhat inhospitable conditions caused by the excessive accumulation of windblown dust across open grasslands during the formation of the loess hills. The distribution of recorded sites suggests that Maçon Ridge was occupied more intensely during the Late Paleo-Indian and Early Archaic Periods. However, during the Late Paleo-Indian Period, hunting camps and base camps normally were located very close to streams, ponds, or sloughs, on landforms generally no more than 1 m (3.3 ft) above the water source, even when higher elevations or ridges were located in the immediate vicinity. This preferential use of the area adjacent to the waterways may reflect the intensive use of the wooded fringes situated along the waterways rather than the exploitation of the open grasslands. By the Early Archaic, settlement shifted to the higher elevations, possibly reflecting an environmental transformation of Maçon Ridge from open grasslands to open woodlands (Hillman 1990). Brain (1983) states that Paleo-Indian projectile points/knives have been found along relict channels of the Mississippi River and remnant Pleistocene surfaces in the floodplain that predate ca. 7000 B.C. In Louisiana, Paleo-Indian sites have been found along Tertiary upland ridges and uplands/floodplain bluffs (Guy and Gunn 1983). Projectile points/knives such as Clovis, Folsom, Scottsbluff, Plainview, and Meserve have been found on the surfaces of these sites. The majority of these projectile points/knives have been found in northern Louisiana; only a very few have been found on late Pleistocene age Prairie Terrace deposits in the southern part of the state.

The previously mentioned Avery Island Site (16IB3), situated near Banana Bayou, is the only substantial Early Paleo-Indian site that has been identified in Management Unit III. It is located on the Avery Island salt dome, near the coast of south-central Louisiana. Although the site produced the remains of Pleistocene fauna intermingled with and/or above lithic artifacts and basketry remains, no diagnostic artifacts were recovered from this component (Gagliano 1970; Neuman 1984). Consequently, the relationship of the faunal remains to the artifacts is unclear.

From the Late Paleo-Indian Period, two cultural phases (the Strohe Phase and the Vatican Phase) have been suggested in the general region encompassing the proposed project area (Ryan et al. 1996). Little is known about the Vatican Phase in south central Louisiana, but the Strohe Phase of southwest Louisiana is bettered documented. This phase was defined by Bonnin and Weinstein (1975, 1978) following the identification of a Dalton-like projectile point type that was recovered during excavation of the multi-component Strohe Site (16JD10) in Jefferson Davis Parish.

In the original publication of *Louisiana's Comprehensive Archaeological Plan*, and based on records obtained from the Division of Archaeology, a total of only four Paleo-Indian sites/

components were documented for Management Unit III (Smith et al. 1983:63). These sites are located in Acadia, Evangeline, St. Landry and Iberia Parishes. The Jefferson Davis Parish component recorded at the Strohe Site (16JD10) was not included in the 1983 publication, nor were two other possible Paleo-Indian components that have been identified at separate multicomponent sites (16AL1 and 16AL36) in Allen Parish. One site previously recorded within 1.6 km (1 mi) of the current project area (Site 16VM125) also has produced artifacts that are diagnostic of the Paleo-Indian Stage; it will be discussed in Chapter V of this text.

Archaic Stage (ca. 6000 - 1550 B.C.)

The term "Archaic" first was developed in the second quarter of the twentieth century as a descriptor for the transitional pre-ceramic cultures that followed the Paleo-Indian Stage. The Archaic Stage can be divided into three subdivisions or periods: Early Archaic, Middle Archaic, and Late Archaic. A warming trend and a drier climate at the end of the Pleistocene, accompanied by a rise in sea level, may have spurred a combination of technological and social developments that now are associated with the initiation of the Archaic Stage (Willey and Phillips 1958). This economic shift has been correlated with highly diverse localized resource and food procurement strategies (Goodwin et al. 1991; Haag 1971). Caldwell (1958) termed this hunting and gathering specialization "primary forest efficiency." Brain (1971) modified this phrase to "primary riverine efficiency" in reference to southeastern riverine and coastal communities. Archaic peoples moved on a seasonal basis within a home range to exploit nuts, fruits, fish, game, shellfish, and other natural resources (Muller 1978). Archaic populations apparently exploited a greater variety of terrestrial and marine species than their Paleo-Indian predecessors did. The increased number of sites dating from the Archaic Stage suggests an increase in population throughout the Southeast. Macrobands formed during the spring and summer months, while in the winter months smaller microbands exploited upland ranges (Muller 1978). Burial sites dating from the Archaic Stage also have been found at numerous locales (Neuman 1984; Walthall 1980), indicating a change in ritual practices from earlier periods. Many populations with successful strategies during the Archaic sequence went on to develop the first semi-permanent settlements (Neitzel and Perry 1977).

An increase in the number of sites dating from the Archaic Stage suggests an overall increase in population throughout the area; *Louisiana's Comprehensive Archaeological Plan* lists 40 sites from this period for Management Unit III, versus only four sites dating from the Paleo-Indian Period (Smith et al. 1983). Previous investigations of the proposed project area identified one possible Archaic site within 1.6 km (1 mi) of the proposed areas of potential effect (APE). This site (16LY23) is located in Lafayette Parish and will be discussed in Chapter V.

The Paleo-Indian to Archaic Stage transition was accompanied by a change in projectile point/knife morphology. These changes included the emergence of a variety of notched and stemmed projectile point/knife forms and the disappearance of the fluted projectile point/knife type. Nevertheless, evidence suggests that there was some continuity between the adaptations of the Paleo-Indian and the later Archaic peoples who occupied the Southeast (Smith 1986). Archaic projectile point/knife sequences follow a general trend in haft morphology that progresses from side-notched to corner-notched to stemmed basal forms. These basal forms, though, are not mutually exclusive. Other Archaic Stage stone flaked artifact types included adzes, scrapers, and choppers. During the latter half of the Archaic Stage, granitic rock, chert, jasper, sandstone, slate, steatite, and scoria were ground and polished into a variety of stone ornaments and tools that included beads, gorgets, bowls, and celts/axes.

Early Archaic Period

In the Southeast, the Early Archaic Period is considered to begin at ca. 8050 - 6050 B.C., but because of the regional variation and the temporal overlapping of stages, the assignment of Late Paleo-Indian and Early Archaic Period artifacts to correct temporal stages can be complex. As noted above, Gibson (1982) used "epipaleoindian" as a term for this transition; Hillman (1985) included Dalton, Hardin, and San Patrice projectile points types in his review of the transitional period at Maçon Ridge.

Dalton projectile points/knives temporally succeeded Clovis projectile points and have been dated between 8550 and 7950 B.C. in Arkansas

and Missouri (Goodyear 1982:382). At the Stanfield-Worley Bluff Shelter (1CT125) in northwestern Alabama, the Dalton zone dates from ca. 7750 - 7050 B.C. (DeJarnette et al. 1962; Griffin 1974). Dalton projectile points also have been found in Horizon 11 at the Koster Site (11GE4) in southern Illinois, which dates from 6750 - 6500 B.C. (Cook 1976) This date suggests that Dalton points/knives may extend later in time than initially presumed.

Dalton projectile points/knives sometimes are recovered with bifacially chipped stone adzes that may represent woodworking tools. Chipped and ground stone celts, probably the functional equivalent of Dalton adzes, have been recovered from the Kirk Horizon in Zone 16 at the St. Albans Site (46WV27) and from Early Archaic sites in the Little Tennessee River Valley (Smith 1986:14). The distribution of Dalton projectile points/knives and other artifacts associated with the Dalton Culture usually are restricted to northern Louisiana.

Some of the earliest recognized Terminal Paleo-Indian/Early Archaic projectile point/knife types identified in Louisiana are the San Patrice, Keithville, and Pelican forms (Webb et al. 1971). Although the distribution of San Patrice points previously was thought to be limited to the area of northwest Louisiana, northeast Texas, and southwest Arkansas, later investigations have extended the geographic range of San Patrice to include an area from central Texas to southwest Alabama, and from southern Louisiana to central Arkansas (Brain 1983:32; Cantley et al. 1984; Giliberti 1995, personal communication).

The San Patrice Culture is believed to represent a local adaptation of hunter/gatherers within restricted ranges. A hallmark of San Patrice is the almost exclusive use of local lithic materials for the production of tools. Tool assemblages include San Patrice and Keithville projectile points/knives, hafted scrapers, Albany side scrapers, unifacial scrapers, burins, and engravers (Webb et al. 1971). Initially, the San Patrice projectile point/knife type consisted of varieties *Hope* and *St. John*, but more recently other varieties have been added to the assemblage in Louisiana, Mississippi, and Alabama (Brain 1983; Giliberti 1995, personal communication). On Maçon Ridge, Hillman (1985) reported that in addition to the *Hope* and *St. John* varieties, the San Patrice projectile point/knife variety (var.) *Keithville* also was present. More recently, archeological investigations in the western part of the state at Fort Polk have produced a number of San Patrice projectile points/knives of differing types, including one that contained a combination of Dalton/San Patrice/Holland affinities (Largent et al. 1992; Williams et al. 1995). Reliable radiocarbon dates for these types are virtually nonexistent, but estimates, based on morphology and stratigraphic placement, range from ca. 8050 - 6050 B.C. (Brain 1983:25; Story et al. 1990:202; Turner and Hester 1985:147; Webb 1981). Ensor (1986) suggests that the San Patrice projectile point/knife type, and related forms in the Southeast, may have developed from the earlier Dalton projectile point/knife forms. Story et al. (1990:197), however, suggest that both Dalton and San Patrice types evolved from the earlier fluted point traditions.

Throughout the Early Archaic, the subsistence pattern probably resembled that of the preceding Paleo-Indian Stage. Early Archaic peoples traveled seasonally in small groups between a series of base camps and extractive sites, hunting deer and collecting edible plants (Chapman and Shea 1981; Lentz 1986; Parmalee 1962; Parmalee et al. 1976).

Tools associated with food processing, including manos, milling stones, and nutting stones, first appear in Early Archaic Period sites. Commonly utilized plant foods, such as walnuts and hickory nuts, could be hulled and eaten without cooking or additional processing (Larson 1980). Herbaceous seeds, which became an important food source later during the Archaic Stage, generally were absent from the diet during the Early Archaic Period (Chapman 1977; Lentz 1986). While living floors associated with hearths, shallow pit features, and milling tools are known from the Early and Middle Archaic, there is little evidence from the Early Archaic Period sites suggestive of below-ground food storage or of substantial structures (Steponaitis 1986:371).

Much of our knowledge regarding Paleo-Indian and Archaic lifeways is limited by problems of preservation. Lithic tools often are the only artifacts to survive, but they provide only limited information about a narrow range of activities (i.e., manufacture and maintenance of tools, processing of meat and hides, and working of wood and bone). Although they rarely are preserved in the archeological record, clothing, bas-

kets, and other artifacts made of perishable materials such as bone, wood, antler, shell, hair, hide, plant fiber, and feathers were no doubt an important part of the Archaic cultural tradition. Impressions of woven mats and net bags preserved in fired clay hearths from Kirk strata at the Icehouse Bottom Site (40MR23) in Tennessee provide rare insight into the richness of the Early Archaic material culture (Chapman and Adavasio 1977).

The Early Archaic cultures immediately preceding San Patrice are little understood in Louisiana. Thus far, diagnostic projectile points/knives dating from the Early Archaic Period, including Cache River, Calf Creek, Kirk, and Palmer, have been recovered only from questionable contexts and in limited numbers. Large Early Archaic sites, such as those identified in Florida, Georgia, Alabama, Tennessee, and the Carolinas, have yet to be recorded in Louisiana. Gagliano's (1963:12) survey of "preceramic" sites in southern Louisiana found that Kirk Serrated projectile points/knives were not uncommon in the southeastern portion of the state; however, no cultural phases have been assigned to either the central or western portions of the state.

Middle Archaic Period

Three interrelated events helped shape prehistoric cultures during the Middle Archaic Period. First, the effects of continental glaciation subsided, resulting in a warmer and drier climate, with modern climatic and environmental conditions prevailing. Second, technological improvements were made, particularly with respect to groundstone, bone, and antler implements. Finally, sociopolitical organization changed in some areas; an increased number of ranked societies and related social developments appeared.

The Middle Archaic Period throughout the southeastern United States is marked by several technological advances and by changes in subsistence patterns. Middle Archaic projectile points tend to be stemmed rather than notched types, such as Eva, Morrow Mountain, Sykes, Benton, and Newnan examples. In addition, the Middle Archaic is represented by projectile points/knives that include Evans, Morrow Mountain, Johnson, Edgewood, and possibly Calcasieu types (Campbell et al. 1990:96; Green 1991; Perino 1985:195). Excavations at Site 16VN791 in Vernon Parish, Louisiana, northwest of the proposed project area in Management Unit I, produced evidence of a long tradition of corner notched projectile points/knives dating from the late Middle Archaic. It has been suggested that these points, and others in the region, were derived from types indigenous to central Louisiana (Campbell et al. 1990).

Other technological innovations include the appearance of ground, pecked, and polished stone tools and the use of celts and grooved axes for heavy woodworking, such as for dugout canoe manufacture. The atlatl, or spear thrower, first appeared during the Middle Archaic, as is indicated by bone atlatl hooks and by the appearance of ground stone bannerstones that apparently were attached to spear throwers and that may have served as counterweights for spear throwers or as fetishes.

The widespread occurrence of plant processing tools such as milling slabs, manos, and nutting stones suggests an increase in the utilization of plant foods. However, comparisons of floral and faunal assemblages from the Early Archaic show little change in the diversity or relative importance of species utilized. The Middle Archaic rough milling tools used in plant processing all have Early Archaic antecedents (Smith 1986:21).

Acorns and hickory nuts continued to be the dominant plant foods. Remains of *Curcurbita* (squash) and bottle gourds appear for the first time during the Middle Archaic. The earliest occurrence of the bottle gourd (*Lagenaria siceraria*) dates from 5340 ± 120 radiocarbon years B.C. at the Windover Site (8BR246) in Florida (Doran et al. 1990). "Squash" rind dating from 5050 B.C. from the Napoleon Hollow (11PK500) and Koster (11GE4) sites in west-central Illinois, initially identified as the cultivar *C. pepo*, now is thought to be representative of the Texas wild gourd (*C. texana*), rather than cultivated squash. Although the seeds of these plants are edible, it appears that their rinds were thin, woody, and inedible; these gourds probably were collected primarily for use as containers rather than as sources of food. Stronger evidence for the domestication of squash gourds occurs after 2350 B.C., i.e., during the Late Archaic (Smith 1987).

In many areas, a major exception to this apparent continuity of earlier subsistence practices was a significant increase in the utilization of fish and shellfish. The rising importance of aquatic

resources can be seen in the development of the extensive shell middens found along many of the southeastern rivers. Shell middens first appear between 4550 and 4050 B.C. during the Hypsithermal (Altithermal) climatic episode, when rivers entered a phase of aggradation and low flow, which promoted the development of oxbow lakes and shallow water shoal habitats favorable for mollusk growth and shellfish collection (Stein 1982). Although the food value of mollusks is low, they can be collected efficiently in bulk and appear to represent the economic focus for semi-sedentary Archaic Stage occupations for many parts of the southeastern United States (Russo et al. 1992).

Extensive deep shell midden sites presumably represent seasonal reoccupation of favored locations by small social groups with band-type socio-political organization. Large cemeteries at some Middle Archaic sites, such as Carleston Annis (15BT5) in Kentucky and Windover (8BR246) and Little Salt Spring (8SO18) in Florida, represent interments made over long periods of time by groups that returned seasonally to these specific locations (Clausen et al. 1979). Increasing population during the Middle Archaic also may have led to more circumscribed territories, which is evidenced by the repeated occupation of favored locations and increased emphasis on locally available raw materials utilized in stone tool manufacture.

Recent research has demonstrated that earthwork and mound building activity occurred at least in isolated instances during the Middle Archaic Period (Saunders 1994, 1996, 1997; Saunders et al. 1992). At present, a total of four possible Middle Archaic mound sites are known in northeast Louisiana: Hedgepeth Mounds (Site 16LI7), Watson Brake Mounds (Site 16OU175), Frenchman's Bend Mounds (Site 16OU259), and Hillman's Mound (Site 16MA201). Of the four, the Watson Brake mound group (16OU175) is the largest and the most securely dated at 5400 years B.P. (ca. 3450 B.C.) (Saunders et. al. 1997:1797). The site consists of 11 mounds and connecting ridges constructed on a terrace above the Ouachita River flood plain. The civic structures at Watson Brake (Site 16OU175), and several other Middle Archaic sites, suggest that hunter-gatherer groups were capable of tasks that required relatively complex social organization and semi-sedentary living.

Additional evidence for emerging social differentiation during the Middle Archaic is seen in objects associated with child burials at sites like Indian Knoll (15OH2) (Webb 1946). Because status in egalitarian societies usually was acquired rather than inherited, and buried children probably did not live long enough to acquire much status, exotic "status" grave objects associated with child burials are seen as one of the earliest indications of inherited social rank.

Only one Middle Archaic Period phase currently is recognized in coastal Louisiana. The Banana Bayou Phase, identified in the Petit Anse region along the central part of the coast, is represented by the artifact assemblage observed by Gagliano (1964) at Avery Island, near Banana Bayou (Neuman 1984).

Late Archaic Period

For most of eastern North America, the Late Archaic represents the first cultural adaptation to an essentially modern environment. By 4000 years ago, the current bay tree-bald cypress, southern pine, southern pine-bald cypress, and oak-southern pine forests were established along both the Gulf and Atlantic Coastal plains (Delcourt and Delcourt 1981). The population structure and boundaries of those forest communities may have varied as a result of subsequent climatic changes, but they remained similar to their modern counterparts.

Evidence shows that the shorelines along the Atlantic and the Gulf still were stabilizing from 3000 to 1000 B.C.; the distribution of Late Archaic sites in those areas indicates that sea levels generally were 1 to 2 m (3.3 to 6.6 ft) below present levels (DePratter and Howard 1980; Griffin and Smith 1954). DePratter and Howard (1980:33-34) also note that coastal conditions in many areas were not conducive to the development of oyster beds until Late Archaic times. Oyster beds and related resources, especially fish, were significant factors in the structure of Late Archaic settlement along the Atlantic and eastern Gulf coasts. Many Late Archaic sites were associated with lower estuaries and upper bays, reflecting a subsistence regime that focused on the use of fish and shellfish. Furthermore, DePratter and Howard (1980:7) list three Late Archaic site types along the Atlantic Coast: circular shell rings/mounds, linear shell middens, and non-shell sites.

The Late Archaic Period was a time of population growth, evidenced by an increasing number of sites found throughout the United States (Griffin 1978). Stone vessels made from steatite, occasional fiber-tempered pottery, and groundstone artifacts characterize the Late Archaic. Late Archaic projectile point/knife types found throughout Louisiana include corner notched and stemmed forms.

In the eastern United States, the Late Archaic economy focused on a few resources, including deer, mussels, and nuts. Jenkins (1979) recognized a seasonal procurement strategy in place in Middle Tennessee during the Late Archaic. During the spring, macrobands formed to exploit forested riverine areas. Archeological investigations of Late Archaic shell middens and mounds indicate a reliance on shellfish, fish, and riverine fauna and flora. During late fall and winter, Late Archaic peoples split into microbands and subsisted on harvested and stored nut foods and faunal species commonly found in the upland areas.

During this period, the mid-south also witnessed the beginnings of indigenous plant domestication, based on a group of cultigens known as the Eastern Agricultural Complex. Although not found in the vicinity of the project area, the remains of domesticated squash, gourds and sunflower have been recovered from parts of Kentucky, Tennessee, north Alabama, and other regions of the mid-south. While domesticated plants often imply the existence of a more sedentary way of life, the seasonal exploitation of resources was still an important element of the Late Archaic subsistence system. Finally, the latter part of the Archaic marked the beginning of trade networks inferred from the presence of exotic items such as those recovered from the burials at the Indian Knoll Site in Kentucky (Muller 1978).

Sites associated with this cultural period typically are found along the boundary of Quaternary and Tertiary areas with relatively flat or undulating bluff tops that overlook the floodplains. Within the region, Late Archaic sites appear on the Prairie terraces and relict levees (Gagliano 1963). According to Russo (1993:20), monumental earthworks also begin to appear at around 2750 B.C.

Archaic style projectile points/knives commonly are found throughout the state; however, few of Louisiana's discrete, intact archeological deposits dating from the Archaic have been excavated systematically, analyzed, and comprehensively reported (Neuman 1984). Those few sites that have been studied carefully are located in the west-central and northern part of the state, and they have yielded projectile points/knives that include Gary, Kent, Palmillas, Carrollton, Marcos, Bulverde, Ensor, Ellis, Epps, Macon, Yarbrough, Motley, Pontchartrain, Delhi, and Sinner types. Groundstone objects recovered from these sites include celts/axes, plummets, and steatite bowl fragments (Campbell et al. 1990; Smith 1975). There is limited evidence for the emergence of mortuary ceremonialism at this time, and greater evidence for widespread trade in shell, copper, slate, greenstone, and jasper ornaments, including carved stone zoomorphic locust beads (Blitz 1993; Brose 1979; Smith 1986:31; Steponaitis 1986:374).

A total of three Late Archaic cultural phases, the generally contemporaneous Pearl River, Copell, and Bayou Blue Phases, have been identified for coastal Louisiana. The Pearl River Phase is found in the eastern part of the state and frequently is associated with either fresh or brackish water shell middens. The Copell Phase has been identified in the Petit Anse region, near the current proposed project area in south central Louisiana. In southwest Louisiana the Bayou Blue Site (16AL1), the Late Archaic type site for the Bayou Blue Phase, is an earthen midden situated on a natural levee that overlooks a relict channel of Bayou Blue in Allen Parish. Artifacts recovered from this site include projectile points/knives and lithic debitage that underlie a later, Marksville Period occupation.

Poverty Point Culture (ca. 2000 - 500 B.C.)

Poverty Point represents a transitional culture that originated ca. 2000 B.C., but it did not realize its full potential until much later. As a result, the Poverty Point sphere of influence probably did not arrive in south central or southwest Louisiana until ca. 1500 B.C. (Gibson 1979, 1994; Neuman 1984; Pertula and Bruseth 1994). The Poverty Point Culture is best known for exhibiting characteristics of a complex society, i.e., massive public architecture and long-distance trade, while maintaining a hunting and foraging economy (Jackson 1991). "Archaeological evidence of the Poverty Point Culture derives from at least

seven, and possibly 10, isolated localities in the Lower Mississippi River Valley" (Gibson 1974:9). In Louisiana, these clusters consist of: Maçon Ridge-Joes Bayou (Poverty Point Cluster), the Neimeyer-Dare group, and the Beau Rivage cluster (Gibson 1974:9). Four groups have been identified in Mississippi: the Savory cluster, the Jaketown cluster, the Teoc Creek cluster and the Claiborne group (Gibson 1974:9). These clusters may represent chiefdoms that regulated the flow of exotic goods to the Poverty Point type site (16WC5) in northeast Louisiana.

Both the Poverty Point Site (16WC5), and the neighboring Jackson Place Mounds (Site 16WC6) are situated adjacent to Bayou Maçon and near several major rivers, including the Mississippi, Tensas, Ouachita, and Boeuf. This riverine location was ideal for exploiting the flow of trade goods from other regions (Jeter and Jackson 1994:142; Muller 1978; Neitzel and Perry 1977) and for cultural diffusion. Evidence of long distance trade at Poverty Point includes ceramic artifacts similar to those from the St. Johns River region of Florida and lithic materials from deposits in Arkansas, Illinois, Indiana, Missouri, Ohio, Oklahoma, and Tennessee (Connaway et al. 1977:106-119; Gibson 1974:26, 1979, 1994a; Jeter and Jackson 1994; Lehmann 1982:11-18; Phillips 1996; Webb 1982:13-14). Conversely, an owl effigy pendant carved from red jasper was found on the bed of the Withlacoochee River in central Florida (Lien et al. 1974 in Webb 1982:50). The Poverty Point Culture may represent the first chiefdom-level society to develop in the eastern United States (Gibson 1985a; Muller 1978).

The Poverty Point Site is distinguished primarily by its large earthworks and its complex microlithic industry. The earthworks include six segmented ridges, 15 to 46 m (50 to 150 ft) wide and approximately 1 to 2 m (3.3 to 6.6 ft) high, that form five sides of an octagon, and several other Poverty Point mounds scattered throughout the immediate site area. The largest mound, Mound A, may be a large bird effigy (Webb 1982). At the time of its construction, Poverty Point was the largest earthwork in the Americas.

The material culture of Poverty Point society was highly distinctive and differentiates these sites from other late Archaic Period sites. Typical Poverty Point Period projectile points include Carrollton, Delhi, Epps, Gary, Kent, Motley, and Pontchartrain (Smith et al. 1983:152; Webb 1982:22,47). Although first made during the Archaic Stage, these stemmed projectile point types frequently were manufactured from either novaculite or gray flint during Poverty Point times (Gibson 1994). The presence of exotic lithic materials may be an indicator of a Poverty Point Period site; these lithic materials include: "dark midwestern flint", Dover flint, Ozark chert, novaculite, magnetite, hematite, limonite, steatite, slate, quartz, galena, red jasper, copper and several others (Gibson 1974:9).

Materials associated with Poverty Point Culture also include atlatl weights, plummets, two hole gorgets, red jasper beads and owl pendants, thin micro flints/blades, Jaketown Perforators, baked clay cooking balls in dozens of geometrical shapes, clay figurines/fetishes, as well as food storage and preparation containers. Container types included sandstone and steatite vessels, basketry, and ceramic materials. Most ceramic vessels were sand tempered, although a minority of grit tempered, clay tempered, and untempered sherds and vessels have been recovered. After about 1350 B.C., fiber tempered pottery appears (Jenkins 1982:55). Webb (1982) also reported the recovery of seed processing implements, polished stone hoe blades, nutting stones, and milling stones.

Little is known of the everyday life of the people of this culture, and it is believed that patterns of hunting and gathering established during the Archaic stage still were practiced by Poverty Point people (Connaway et al. 1977; Webb 1982). Although gourd and squash were present and may have been cultivated (as suggested by the presence of chipped stone hoes with use polish), it appears that maize agriculture was never a part of Poverty Point subsistence (Smith 1986:35). Starchy and oily seeds were rare in flotation samples from the J. W. Copes Site (16MA47) and may have been of only limited significance (Fritz and Kidder 1993:6). Preferred resources appear to have been deer, pecan nuts (*Carya illinoensis*), and catfish (Jackson 1986).

Although earthen ovens also have been identified, baked clay balls (Poverty Point Objects [PPO]) and stone/ceramic containers may have provided technological means for increasing the efficiency and caloric return of previously utilized resources such as pecans. Experiments show that boiling is a significantly more efficient means of extracting food value from *Carya* nuts than

hand cracking; more nutmeat and oil are recovered through boiling (Munson 1988).

Brain (1971) describes Poverty Point as a bottomland occurrence, while Webb (1982) suggests that Poverty Point sites typically are found in four locations. These areas include the Quaternary terraces or older land masses that overlook major stream courses, major river levees along active or relict river channels, river-lake junctions, and coastal estuaries or older land surfaces located within coastal marshes. Poverty Point sites appear to be located in areas that would have been ideal for exploiting forest-edge resources and for transporting exotic materials. Sites range in size from large ceremonial centers to more frequently identified hamlets or foraging stations. On several of the larger Poverty Point Culture sites, earthworks or shell middens occur either as mounds or in circular patterns.

In southeast Louisiana, small shell middens located along the shoreline of Lake Pontchartrain exhibit Poverty Point traits and suggest seasonal and specialized adaptations to marsh environments. These sites represent two phases of Poverty Point Culture: the Bayou Jasmine Phase and the Garcia Phase. Bayou Jasmine Phase sites are located on the western shore of the lake as well as along the natural levee ridges of the Mississippi River distributaries. Garcia Phase sites are located along the eastern shore of Lake Pontchartrain. The Garcia Site (16OR34), the type site for the Garcia Phase, was found to contain a beach deposit of *Rangia* shells and midden debris. Radiocarbon dates from Bayou Jasmine Phase components cluster around 3450 B.P., while Garcia Phase sites date about 1,000 years later (Gagliano 1963; Gagliano and Saucier 1963). Bayou Jasmine Phase sites, such as the type site (16SJB2) located along the western shore of the lake, exhibit Poverty Point traits exclusively (Duhe 1976). In contrast, Garcia Phase sites, i.e., those found along the eastern shore, contain both bone tool and microlithic industries (Gagliano and Saucier 1963).

Closer to the general vicinity of the current proposed project area, Phillips (1970) identified a Poverty Point phase that he labeled Rabbit Island. Sites associated with the Rabbit Island Phase are situated in the Teche-Mississippi region of coastal Louisiana, and artifacts recovered from the type site include non-local lithic materials, microlithics, and baked clay objects (Gagliano 1963). Subsequently, the name Beau Rivage was applied by Gibson (1975) to four Poverty Period sites (16LY5, 16LY6, 16LY13, and 16SL2) that he investigated in Lafayette Parish, Louisiana, and that apparently represent a distinct phase. The type site (Beau Rivage [16LY5]) is located within the Lafayette corporate limits, and sites of this phase are found in a different geographic setting than sites of the Rabbit Island Phase; they occur to the northwest of the previously recorded Rabbit Island sites and they occupy the edge of the prairie terrace that overlooks the alluvial plain (Gibson 1980). A typical Beau Rivage artifact assemblage includes Poverty Point ceramic objects (clay balls and figurines) and lithic materials, as well as decorative rectangular or circular ceramic objects that have not yet been recovered at more inland Poverty Point locations. Diagnostic projectile points/knives have included, among others, examples of Gary, Wells, Evans, Elam, Sinner, Ellis, Delhi, Marshall, and Palmillas points. These lithic projectile points/knives are characteristically shorter and narrower than those found at other Poverty Point sites.

Bayou Rivage and Rabbit Island Phase sites apparently represent geographically distinct examples of Poverty Point Culture in south central Louisiana. While Gibson (1975) dates the Bayou Rivage Phase from ca. 1500 - 650 B.C., no dates have been suggested for the Rabbit Island Phase. Additional research is required to provide solid chronological information, and to reach conclusions about the relationship between the two phases. In the original publication of *Louisiana's Comprehensive Archaeological Plan,* 15 Poverty Point sites/components were documented in Management Unit III (Smith et al. 1983).

Woodland Stage (ca. 500 B.C. - A.D. 1000)

Despite the many innovations introduced during the Poverty Point cultural period, it is portrayed frequently as either a Late Archaic culture or as a pre-Woodland transitional manifestation. The Woodland Stage in Louisiana is a formative one that is characterized by a combination of itinerant and possibly sedentary agriculture, the introduction of the bow and arrow, and the widespread use of ceramics. The Woodland Stage includes three periods: Early Woodland, Middle Woodland, and Late Woodland. The Early Woodland (ca. 500 B.C. - A.D. 300) is represented by the Tchefuncte Culture, the Middle Woodland (ca. A.D. 1 - 400) is associated with the

Marksville Culture and to a lesser extent the Troyville Culture, and the Late Woodland (ca. A.D. 400 - 1200) originated with the Troyville Culture but is dominated by the Coles Creek Culture. In most parts of the region, the Woodland Stage was eclipsed by the Plaquemine Culture (i.e., the florescence of the Mississippian Stage).

Tchefuncte Culture (ca. 500 B.C. - A.D. 300)

Tchefuncte Culture is characterized by the first widespread use of pottery within the context of a hunting and gathering tradition and a tool inventory that are reminiscent of the Late Archaic (Byrd 1994; Neuman 1984; Shenkel 1981:23). The culture first was identified at the type site (16ST1), which is located on the north shore of Lake Pontchartrain in southeast Louisiana (Ford and Quimby 1945; Weinstein and Rivet 1978). Later, the Tchefuncte Culture was defined by Ford and Quimby (1945) based on Works Progress Administration (WPA) excavations at Big Oak Island (16OR6) and Little Woods Midden (16OR1-5), both of which are situated on the southeastern edge of the lake in Orleans Parish.

Originally, the Tchefuncte Culture was thought to be a local adaptation by an indigenous populace to the southwest Louisiana coast and to the central portion of the Vermilion River in south-central Louisiana. Tchefuncte or Tchefuncte-like ceramics now have been found in southeast Missouri, northwest Mississippi, the Yazoo Basin, coastal Alabama, and east Texas (Brookes and Taylor 1986:23-27; Mainfort 1986:54; Neuman 1984; Webb et al. 1969:32-35; Weinstein 1986:102). In coastal Louisiana, five phases have been designated for the Tchefuncte Period. From west to east, these are the Sabine Lake Phase bordering Sabine Lake in southeast Texas and southwest Louisiana; the Grand Lake Phase in the Grand Lake and Vermilion Bay area; the Lafayette Phase on the west side of the Atchafalaya basin (west of the Vermilion River); the Beau Mire Phase below Baton Rouge in the Ascension Parish area; and the Pontchartrain Phase, encompassing Lake Maurepas and Lake Pontchartrain in the Pontchartrain Basin (Weinstein 1986:108). Within the coastal region situated adjacent to the currently proposed project area only two phases (Grand Lake and Lafayette) have been documented.

For the purpose of this review, a date range extending from ca. 500 B.C. to A.D. 300 for the Tchefuncte Culture will be used; however, research suggests that dates for the Tchefuncte differ quite widely from region to region and occasionally within the same region (Webb et al. 1969:96; Weinstein 1986). Most scholars agree that Tchefuncte dates from as early as 700 B.C. in the south and that it diffuses to the north, where it is known as Tchula, and terminates sometime around A.D. 100 (Gibson and Shenkel 1988:14; Perrault and Weinstein 1994:48-49; Shenkel 1974:47; Toth 1988:19). There is, however, evidence suggesting that some coastal Tchefuncte sites were occupied as late as ca. A.D. 300 (Byrd 1994:23; Neuman 1984:135). If these dates are correct, then the last remaining coastal Tchefuncte communities were coeval with Marksville Culture (Toth 1988:27-28).

Tchefuncte ceramics usually are characterized by a soft, chalky paste, and a laminated cross-section. They were fired at a low temperature and tempered with either sand or clay (Phillips 1970). Vessel forms consist of bowls, cylindrical and shouldered jars, and globular pots that sometimes exhibit podal supports. Many vessels are plain; however, some are decorated with punctations, incisions, simple stamping, drag and jab, and rocker stamping. Punctated types usually are more numerous than stamped types, but parallel and zoned banding, stippled triangles, chevrons, and nested diamonds also represent popular motifs. During the later portion of the Tchefuncte Period, red filming also was used to decorate some vessels (Perrault and Weinstein 1994:46-47; Phillips 1970; Speaker et al. 1986:38).

For the most part, the stone and bone tool subassemblages remained nearly unchanged from the preceding Poverty Point Culture. Stone tools included boat stones, grooved plummets, chipped celts, and sandstone saws; bone tools included awls, fish hooks, socketed antler points, and ornaments. In addition, some tools such as chisels, containers, punches, and ornamental artifacts were manufactured from shell. Projectile points/knives characteristic of Tchefuncte Culture include Gary, Ellis, Delhi, Motley, Pontchartrain, Macon, and Epps (Ford and Quimby 1945; Smith et al. 1983:163). Bone and antler artifacts, such as points, hooks, awls, and handles became increasingly common during this period.

Tchefuncte sites generally are classified either as coastal middens, or as inland villages or hamlets. Settlement usually occurred along the slack-water environments of slow, secondary streams that drained bottomlands, floodplain lakes, and littoral zones (Neuman 1984; Toth 1988:21-23). Tchefuncte burials and artifacts from sites in southwest and south central Louisiana suggest an egalitarian social organization. The population probably operated at the band level, with as many as 25 to 50 individuals per band. The widespread distribution of similar ceramic types and motifs implies a patrilocal residence with exogamous band marriage (Speaker et al. 1986:39). Social organization probably remained focused within macrobands, and hunting, gathering, and fishing remained integral to Tchefuncte life. Shell midden sites and their associated faunal remains are well known for the Tchefuncte Culture and they document the wide variety of food resources utilized during this period. Recovered faunal remains include deer, opossum, muskrat, raccoon, otter, bear, fox, dog, ocelot, wildcat, alligator, bird, fish, shellfish (freshwater and marine), and turtle (aquatic and terrestrial). Recovered plant remains (all non-domesticated) include squash, gourds, plums, nuts, grapes, and persimmons (Neuman 1984; Smith et al. 1983). Neuman (1984) notes that the remains of crustaceans such as crabs, shrimp, and crawfish do not appear within the Tchefuncte middens. The absence of such readily available food sources may reflect their relatively low caloric value.

Examination of faunal and floral remains from Morton Shell Mound (16IB3), a coastal Tchefuncte shell midden in Iberia Parish, suggests that some coastal sites were occupied on a seasonal basis, usually in the summer and autumn, and possibly during the spring (Byrd 1994:103). However, McGimsey (1997:11) notes that year round occupations have been documented for coastal sites and also may have occurred at a majority of the riverine sites in Managment Unit III (Byrd 1974; Neuman 1984:122). The preponderance of freshwater fish remains at coastal southeastern Louisiana sites such as Big Oak Island (16OR6) and Little Oak Island (16OR7) indicates a reliance on aquatic resources (Shenkel and Gibson 1974). As of 1983, the original publication date for *Louisiana's Comprehensive Archaeological Plan*, 37 Tchefuncte Period sites or components had been documented in Management Unit III (Smith et al. 1983). Only eight of these sites/components were located in Lafayette Parish (n=4) and Vermilion Parish (n=4). None of these recorded sites are located within the immediate 1.6 km (1 mi) vicinity of the current project undertaking.

Marksville Culture (ca. A.D. 1 - 400)

Marksville Culture, named for the Marksville Site (16AV1) in Avoyelles Parish, often is viewed as a localized version of the elaborate midwestern Hopewell Culture which filtered down the Mississippi River from Illinois (Toth 1988:29-73). That the Marksville peoples possessed more highly organized social structure than their Tchefuncte predecessors is implied by the complex geometric earthworks, conical burial mounds for the elite, and unique mortuary ritual systems that characterize Marksville. Some items, such as intricately decorated ceramics, were manufactured primarily for inclusion in burials. Burial items also frequently consisted of pearl beads, carved stone effigy pipes, copper ear spools, copper tubes, galena beads, and carved coal objects. Toward the end of the Marksville Period, Hopewellian influences declined, and mortuary practices became less complex (Smith et al. 1983; Speaker et al. 1986).

Ceramic decorative motifs such as cross-hatching, U-shaped incised lines, zoned dentate rocker stamping, cord-wrapped stick impressions, stylized birds, and bisected circles were shared by the Marksville and Hopewell Cultures (Toth 1988:45-50). Additional Marksville traits include a chipped stone assemblage of knives, scrapers, celts, drills, ground stone atlatl weights and plummets, bone awls and fishhooks, baked clay balls, and medium to large stemmed projectile points dominated by the Gary type.

A variety of exotic artifacts commonly found at Marksville sites suggests extensive trade networks and possibly a ranked society. Some commonly recovered exotic items include imported copper earspools, panpipes, platform pipes, figurines, and beads (Toth 1988:50-73; Neuman 1984). The utilitarian material culture remained essentially unchanged, reflecting an overall continuity in subsistence patterns (Toth 1988:211).

Marksville peoples probably used a hunting, fishing, and gathering subsistence strategy much like those associated with earlier periods. Gagliano (1979) suggests that food procurement activities were a cyclical/seasonal (transhumance)

activity that revolved around two or more shifting camps. In the southeastern part of the state, shellfish collecting stations on natural levees and lower terraces around Lake Pontchartrain and Lake Maurepas were occupied and utilized during the summer months. During the winter months, semi-permanent hunting/gathering camps on the prairie terrace were occupied. This subsistence technique reflects the fission and fusion that probably originated during the Archaic Stage.

There may also have been an increased focus on the use of oily seeds (marsh elder, sunflower, curcurbits) and starchy seeds (chenopodium, wild bean, maygrass, knotweed, little barley) (Fritz and Kidder 1993:7; Smith 1986:51). At the Reno Brake Site (16TE93) in Tensas Parish, Kidder and Fritz (1993) recovered subsistence remains from deer, squirrel, rabbit, bird, and fish as well as acorns, persimmons, palmettos, grapes, blackberries, and very minor amounts of chenopodium and sumpweed. Although maize has been identified and dated from a Middle Woodland context at sites in Tennessee and Ohio (Ford 1987), maize does not appear to have been of economic significance until much later, i.e., during Mississippian times (Fritz and Kidder 1993:7; Kidder and Fritz 1993:294; Smith 1986:50-51).

Definition of phases of the Marksville Culture has been based largely on combinations of diagnostic ceramic traits. Within the general vicinity of the current proposed project area, two phases (Jefferson Island and Veazey) have been identified. These phases are found in the south central or Petite Anse region of the state, and representative sites typically are situated along the Teche-Mississippi river channel (specifically, the Jefferson saltdome). Jefferson Island Phase sites, discussed by Toth (1977), date from ca. A.D. 1 to 200. Decorated ceramics from this early phase are characterized by curvilinear motifs, rocker stamping, and fabric impression. The Veazey Phase dates from ca. A.D. 200 - 400. This second phase, named for the Veazey Site (16VM7) in Vermilion Parish, frequently is associated with a scant presence of Late Marksville/Issaquena ceramic sherds that overlay Tchefuncte Period sites of the Grand Lake Phase (Jeter et al. 1989; Phillips 1970). Additionally, two southwest Louisiana phases, Lacassine and Lake Arthur, apparently are contemporaries of the Jefferson Island and the Veazey Phases, respectively. While the Lacassine Phase has been well documented by Bonnin and Weinstein (1975 and 1978) on the basis of excavations at the multicomponent Strohe Site (16JD10), the Lake Arthur Phase has been defined only poorly (Bonnin and Weinstein 1978). According to Phillips (1970), coastal sites from the latter part of the Marksville cultural period may contain Marksville Stamped *var. Troyville*, Yokena Incised, and Churupa Punctated ceramic sherds (Jeter et al. 1989).

As of 1983, the original publication date for *Louisiana's Comprehensive Archaeological Plan*, 38 Marksville sites had been documented in Management Unit III (Smith et al. 1983). While none of these sites is located in the immediate vicinity (i.e., within 1.6 km [1 mi]) of the current proposed project area, they have been recorded in both Lafayette (n=3) and Vermilion Parishes (n=7).

Troyville-Coles Creek Period (ca. A.D. 400 - 1200)

The Troyville Culture, labeled Baytown elsewhere, was named after the mostly destroyed Troyville mound group (16CT7) in Jonesville, Catahoula Parish, Louisiana (For a discussion of the Troyville/Baytown issue, see Gibson 1984 or Belmont 1984). Troyville represents a transition from the Middle to Late Woodland Period that culminated in the Coles Creek Culture (Gibson 1984). Though distinct, these two cultures share a sufficient number of traits to cause many researchers to group them as a single prehistoric cultural unit (Belmont 1967). According to Neuman (1984:169), 23 ^{14}C dates for 14 Troyville-Coles Creek sites in Louisiana place the beginning of Troyville Culture at A.D 395. In addition, Kidder (1988:57) places the beginning of the Coles Creek Culture at some time between ca. A.D. 700 and A.D. 800. The continuing developments of agriculture and the refinement of the bow and arrow during this time (reflected by Alba, Catahoula, Friley, Hayes, and Livermore projectile point types) radically altered subsequent prehistoric lifeways. During the Troyville cultural period, bean and squash agriculture may have become widespread, as is suggested by the appearance of large ceramic vessels in the archeological record. This shift in subsistence practices probably fostered the development of more complex settlement patterns and social organization.

Only two Troyville Phases (Whitehall and Roanoke) have been described in the coastal re-

gion of Louisiana, and these coexistent phases are separated only by their geographic distance (Jeter et al. 1989). According to Phillips (1970), the Whitehall Phase is used to describe the Troyville Period in the eastern portion of state. The Roanoke Phase of west Louisiana was defined more recently by Bonnin and Weinstein (1978) based on information gathered during excavation of the Strohe Site (16JD10).

The Late Woodland Coles Creek Culture emerged from Troyville around A.D. 750 and represented an era of considerable economic and social change in the Lower Mississippi Valley. By the end of the Coles Creek Period, communities became larger and more socially and politically complex, large-scale mound construction occurred, and near the end of the period, there is evidence for the resumption of long-distance trade on a scale not seen since Poverty Point times. These changes imply that a chiefdom-like society was re-emerging in the Lower Mississippi Valley (Muller 1978). The diffusion of material and sociopolitical concepts from the Midwest may be indicated by the fact that Coles Creek ceramics have been recovered from early Cahokian contexts dating from ca. A.D. 900 in southeastern Missouri (Kelly 1990:136). These changes probably initiated the transformation of Coles Creek cultural traits into what now is recognized as the Plaquemine Culture at sometime around A.D. 1200 (Jeter et al. 1989; Williams and Brain 1983).

Ceramics of the Troyville/Coles Creek Period are distinguished by their grog and grog/sand tempers, as opposed to the chalky, sand tempered paste of the previous ceramic series. Decorative motifs include cord marking, red filming, and simplified zoned rocker-stamping, as well as decorations with incised lines and curvilinear lines. As was noted by McIntire (1958), the Coles Creek peoples continued to produce the earlier Troyville wares, with only minor elaborations. For instance, the Churupa Punctated and the Mazique Incised designs, both of which are characteristic of the Troyville Culture, were used by both Coles Creek and later Plaquemine pottery makers (McIntire 1958). Similarly, French Fork Incised, which formed the basis for many Troyville classifications, continued to be used well into the Coles Creek Period (Phillips 1970).

Coles Creek peoples also developed a new ceramic complex that included larger vessels and a wider range of decorative motifs, usually positioned on the upper half of the vessel (Neuman 1984). Coles Creek Incised, Beldeau Incised, and Pontchartrain Check Stamped characterize the period (Phillips 1970; Weinstein et al. 1979). A distinctive decorative type, Coles Creek Incised, contains a series of parallel, incised lines placed perpendicular to the rim of the vessel, often accompanied underneath by a row of triangular impressions (Phillips 1970:70; Phillips et al. 1951:96-97). Several of the ceramic motifs suggest outside cultural influences. French Fork Incised motifs and decorative techniques, for example, mimic almost exactly Weeden Island Incised and Weeden Island Punctated ceramics from the northwest Florida Gulf Coast (Phillips 1970:84; Phillips et al. 1951:101; Willey 1949:411-422). Pontchartrain Check Stamped ceramics also appear at the same time as the resurgence of the check stamped ceramic tradition Weeden Island III in northwest Florida (Brown 1982:31).

Sites from the Coles Creek cultural period were situated primarily along stream systems where soil composition and fertility were favorable for agriculture. Natural levees, particularly those situated along old cutoffs and inactive channels, appear to have been the most desirable locations (Neuman 1984). Most large Coles Creek sites contain one or more pyramidal mounds. Coles Creek mounds typically are larger, and exhibit more building episodes, than the earlier Marksville burial mounds. Burials occasionally are recovered from Coles Creek mounds; however, the primary function of the mounds appears to have been ceremonial. At some Coles Creek sites, mounds are connected by low, narrow causeways; sometimes, plazas are associated with these multiple mound sites (Gibson 1985b). The sophistication of Coles Creek mound systems suggests a more complex social structure; a centralized authority and sizable labor force must have existed to build, maintain, and utilize these mounds. The centralized authority probably was of a special religious class, while the general population occupied the region surrounding the large ceremonial centers (Gibson 1985b; Neuman 1984; Smith et al. 1983).

In general, small Coles Creek sites consist mostly of hamlets and shell middens, and they normally do not contain mounds. Coles Creek shell middens are found most commonly in the coastal region where they occupy higher portions of natural levees (Springer 1974).

Recent work has dispelled the old theory that an intensification of agriculture, particularly maize (*Zea mays* spp. *mays*) and squash (*Cucurbita pepo*), created the stable base from which the Coles Creek Culture arose and flourished. Although Coles Creek populations exhibit tooth decay rates consistent with a diet based on starchy foods such as maize, limited archeobotanical evidence for maize in Coles Creek midden deposits suggests that consumption of some other starchy foods must be the cause (Kidder 1992; Steponaitis 1986). While researchers speculate that the use of cultigens, especially squash species, as a dietary supplement occurred in conjunction with the incipient Coles Creek Culture, evidence of dependence on domesticated plants has been lacking at early Coles Creek and related Plum Bayou sites (Kidder and Fritz 1993; Kidder 1992). The preponderance of evidence now available indicates that cultivation and consumption of maize was not widespread in the Lower Mississippi Valley until after the Coles Creek Period, ca. A.D. 1200 (Kidder 1992:26; Kidder and Fritz 1993). Thus, while maize existed during the Coles Creek Period, and has been recovered archeologically, it was not the economic basis of the society.

Some sites in the Petite Anse region, e.g., the Morgan Site (16VM9; Brown 1981; Fuller and Fuller 1987), have produced limited amounts of wild plant species, however, subsistence in the coastal region of Louisiana apparently was based on the exploitation of available aquatic and/or terrestrial animal resources. Excavations by Goodwin et al. (1986) at Site 16CM61, a *Rangia* shell midden in the western part of the state, indicated patterns of seasonal exploitation for both marine mollusks and fish. Additionally, at the Pierre Clement Site (16CM47) in Cameron Parish, Springer (1979) documented a variety of faunal material including mammals, avians, reptiles, and fish that originated from a Coles Creek component.

Earlier assumptions about the nature and extent of social and political differentiation during the Coles Creek Period also must be reexamined. Square-sided, flat-topped mounds that are believed to have served as platform bases for elite structures appear first during the Coles Creek Period. However, evidence for the elite residential or mortuary structures often said to be associated with Coles Creek mounds remains elusive prior to A.D. 1000 (Kidder and Fritz 1993; Smith 1986; Steponaitis 1986). Both the form of the platform mounds and their arrangement around plazas may be indicative of Meso-american influence (Willey and Phillips 1958; Williams and Brain 1983).

In the central and western areas of coastal Louisiana, early, middle, and late (transitional) phases have been defined both for the Coles Creek and the transitional Coles Creek cultural periods (Bonnin and Weinstein 1978; Brown 1984; Weinstein 1986:108; Ryan et al. 1996:Figure 3; Jeter et al. 1989). In the Petite Anse region, these include the White Lake Phase (ca. A.D. 700 - 900); the Morgan Phase (ca. A.D. 900 - 1000); and the Three Bayou Phase (ca. A.D. 1000 - 1200). The Coles Creek phases of southwest Louisiana are nearly contemporaneous, and consist of the Welsh (ca. A.D. 700 - 850), Jeff Davis (ca. 850 - 1000), and Holly Beach Phases (ca. A.D. 1000 - 1200).

Louisiana's Comprehensive Archaeological Plan documents 196 sites with Troyville-Coles Creek components within Management Unit III (Smith et al. 1983); however, the majority of these sites lie to the south of the proposed project area. At that time, only 27 Troyville-Coles Creek sites had been recorded in the two parishes that are associated with the proposed project. These sites occur both in Lafayette (n=4) and Vermilion (n=23) Parishes.

Mississippian Period (ca. A.D. 1200 - 1700)

The Mississippian Stage represents a cultural climax in population growth and social and political organization for those cultures occupying the southeastern United States (Phillips 1970; Williams and Brain 1983). In the Lower Mississippi Valley, the advent of the Mississippian Stage is represented at sites along the Lower Mississippi Valley and along the northern Gulf Coast by incorporation of traits such as shell tempered ceramics, triangular arrow points, copper-sheathed wooden earspools, and maize/beans/squash agriculture (Williams and Brain 1983). Formalized site plans consisting of large substructure "temple mounds" and plazas have been noted throughout the Southeast at such places as Winterville, Transylvania, Natchez, Moundville, Bottle Creek, and Etowah (Hudson 1978; Knight 1984; Walthall 1980; Williams and Brain 1983). In the coastal region of Louisiana, the Mississippian Culture stage is characterized by both the

Plaquemine or Emergent Mississippian Period (A.D. 1200 - 1450) and by the Late Mississippian Period (A.D. 1450 - 1700). However, it is likely that in some parts of the region either Plaquemine Culture or a hybrid of that culture was in existence until European contact (Jeter et al. 1989).

Within Management Unit III, *Louisiana's Comprehensive Archaeological Plan* (Smith et al. (1983:63) reports 83 sites from the Plaquemine (Emergent Mississippian) Period, but only 13 from the Late Mississippian Period. Of these 96 sites, a total of 22 (19 Plaquemine and 3 Mississippian sites) have been recorded in Lafayette and Vermilion Parishes. Only one Mississippian site (16VM125; the Archie Picard Site), an artifact scatter associated with the Plaquemine Culture, is located within the immediate vicinity of the project undertaking; Site 16VM105 will be discussed in Chapter V.

Emergent Mississippian Period (A.D. 1200 - 1450/1700)

The Emergent Mississippian Period Plaquemine Culture appears to represent a transitional phase from the Coles Creek Culture to a pure Mississippian Culture (Kidder 1988). Interaction with the emerging Mississippian Cultures of the Middle Mississippi Valley probably exerted enough influence during the latter part of the Coles Creek Period to initiate the cultural change that eventually became the Plaquemine Culture. The Medora Site (16WBR1), described by Quimby (1951) and considered to be the type site, typifies Plaquemine Culture. Plaquemine peoples continued the settlement patterns, economic organization, and religious practices established during the Coles Creek Period; however, agriculture, sociopolitical structure, and religious ceremonialism intensified, suggesting a complex social hierarchy. Sites typically are characterized either as ceremonial sites, with multiple mounds surrounding a central plaza, or as dispersed villages and hamlets (Neuman 1984; Smith et al. 1983).

Plaquemine lithic assemblages are quite similar to those of the preceding Troyville-Coles Creek cultural complex and are dominated by the same small projectile point styles (Smith et al. 1983). In addition, Plaquemine ceramics are derived from the Coles Creek tradition, although they display distinctive features that mark the emergence of a new cultural tradition. In addition to incising and punctuating their ceramics, Plaquemine craftsmen also brushed and engraved decorations on their vessels (Phillips 1970). Plaquemine Brushed appears to have been the most widespread ceramic type. Plaquemine ceramic types included Leland Incised, Hardy Incised, L'Eau Noire Incised, Anna Burnished Plain, and Addis Plain.

In the past, the cultural achievements of the Plaquemine Period were thought to have been supported by the intensive cultivation of maize. During the early part of this period, subsistence may have shifted to agriculture that was supplemented by native plants and animals; however, evidence of intensive agriculture has been inconclusive (Kidder and Fritz 1993:9).

Gregory (1969) indicates that Plaquemine site distributions reveal a preference for lowland areas including swamps and marshes. However, Neuman (1984) cites Hally's (1972) observation that Plaquemine Culture sites in the upper Tensas basin were located most frequently on well-drained natural levees characterized by sandy soils. In general, coastal sites tend to be smaller and less elaborate; it has been suggested that coastal shell middens are a product of early Plaquemine activities (Brown et al. 1979; Davis et al. 1979). The presence of these sites may indicate the persistence of seasonal food procurement strategies. By ca. A.D. 1450, Kidder (1988) asserts that the Plaquemine Culture had evolved into a true Mississippian Culture.

In the Petit Anse region of south Louisiana, Brown (1985) contends that coastal Plaquemine populations descended from incipient Coles Creek peoples, and there is ample evidence of continuance from this preceding culture (e.g., Hally 1972, Jeter et al. 1989; Phillips 1970). Under this scheme, the transitional Coles Creek Three Bayou Phase (ca. A.D. 1000 - 1200) is supplanted by the ensuing Burk Hill Phase (ca. A.D. 1200 - 1600). This phase includes sites along Vermilion Bay, and around the Salt Dome Islands (Brown 1985). In southwest Louisiana, the Bayou Chene Phase (ca. A.D. 1200 - 1700) has been explained by Weinstein (1985) as a localized expression of Plaquemine/Mississippian development. The Bayou Chene Phase is based on the interaction of Transitional Coles Creek/Plaquemine peoples

with those of a more localized tradition that probably originated as a result of migrations or diffusion from southeast Texas.

Late Mississippian Period (A.D. 1450 - 1700)

During this time, several traits that are now definitive of the Mississippian Period were widespread across most of the Southeast. These diagnostic traits include well-designed mound groups, a wide distribution of sites and trade networks, shell tempered ceramics, and a revival in ceremonial burial of the dead (Griffin 1990:7-9). In coastal Louisiana, Late Mississippian Culture probably is related to the Pensacola variant. It is Knight's (1984) contention that displaced Mississippian populations from the central Gulf Coast, i.e., the Mobile Bay area and the Alabama/Tombigbee river systems, resettled in coastal Louisiana. Additionally, Brown and Lambert- Brown (1978) have recovered Yazoo River Basin-like pottery from Avery Island in the Petit Anse region.

Mississippian subsistence was based on the cultivation of maize, beans, squash, and pumpkins; collection of local plants, nuts, and seeds; and fishing and hunting of local species. Major Mississippian sites were located on fertile bottomlands of major river valleys; sandy and light loam soils usually composed these bottomlands. A typical Mississippian settlement consisted of an orderly arrangement of village houses surrounding a truncated pyramidal mound. These mounds served as platforms for temples or as houses for the elite. A highly organized and complex social system undoubtedly existed to plan these intricate communities.

Ceramic types frequently were characterized by shell tempering, an innovation that enabled potters to create larger vessels (Brain 1971; Steponaitis 1983). Ceramic vessels included such forms as globular jars, plates, bottles, pots, and salt pans. The loop handle has been noted on many Mississippian vessels. Although utilitarian plainware was common, decorative techniques included engraving, negative painting, and incising; modelled animal heads and anthropomorphic images also adorned ceramic vessels. Other Mississippian artifacts included chipped and groundstone tools; shell items such as hairpins, beads, and gorgets; and mica and copper items. Chipped and ground stone tools and projectile point styles such as Alba and Bassett also were common.

Mississippian Culture had a weak presence in south central and southwestern Louisiana, and only two Mississippian or Mississippian-like phases have been recognized. The first, Petite Anse (ca. A.D. 1600 - 1700), has been used to describe Mississippian peoples/traders from the lower Yazoo river basin who traveled to the Petit Anse region (Avery Island) to procure salt (Brown and Lambert-Brown 1978). The second, in southwest Louisiana, is the Little Pecan Phase (ca. A.D. 1650/1700 - 1750); it is associated with the historic Attakapa, and represents a synthesis of ceramic types that originate from the Lower Mississippi Valley, Louisiana, and from Texas (Frank 1976; Jeter et al. 1989).

Protohistoric and Early Historic Period (A.D. 1500 - 1800)

An understanding of protohistoric and historic Native American cultures of the southeastern United States is severely limited by our frequent inability to recognize the ancestral cultures from which these groups were derived. This is due partially to the waning influence of Mississippian Culture, but primarily is a result of the social disruption initiated by the legacy of the de Soto entrada of 1539 - 1543, and the subsequent French and Spanish exploration and colonization throughout the Southeast. These social interactions necessitated a major social/demographic reorganization. Native American population upheaval and depletions were related to warfare, disruptive migrations, and epidemics introduced by European contact (Davis 1984; Smith 1989). Information on protohistoric and historic populations, gleaned only in part from the archeological record, relies predominately on early European chroniclers, the historical record, and later ethnographic accounts of this tumultuous era.

According to *Louisiana's Comprehensive Archaeological Plan* (Smith et al. 1983), only two Native American groups (Attakapa and Opelousa) occupied Management Unit III at the time of European contact; however, Swanton (1946) also reported the presence of the Chitimacha in this region. Little is known of the Opelousa who were decimated by European disease between 1715 and 1804; however, Swanton (1946) states that they probably were members of the Attakapan

linguistic family. The second group was the Attakapa, a Choctaw and Mobilian phrase meaning "man eater" or "eaters of human flesh". While no acts of their reported cannibalism have ever been documented, this information may have been taken from a French officer, Simars de Delle-Isle, who was stranded on the Louisiana coast in 1719 (Post 1962). The Attakapa are known to have consisted of three or more groups that lived on the Calcasieu, Mermentau, and Vermilion Rivers of Louisiana but extended as far west as the Trinity River in Texas (Aten 1983; Swanton 1946).

Convention holds that as the influence of Mississippian Culture declined throughout the Southeast, populations along the northern Gulf Coast reverted to egalitarian societies and readopted the localized/regional hunting and gathering subsistence strategies that had been successful throughout the Archaic and Woodland stages (Peebles and Kus 1977; Peebles and Mann 1983). These strategies frequently were augmented by either itinerant horticulture or small-scale agriculture that produced corn, beans, and squash. Both archeological and ethnographic evidence indicates that the historic Attakapa lived an Archaic stage-like existence of fishing, hunting, and plant gathering.

The historical record indicates that the Attakapa interacted both with the French and the Spanish, and Swanton (1946) reports that in 1779, they allied against the British and supplied both men and supplies to Galvez for the purpose of attacking forts on the Mississippi River. Disease and disruptive migrations due to colonial expansion and to the change in ownership of the regions from France to Spain and subsequently to England accounted for the disintegration of aboriginal populations in the area. Subsequently, only about 80 Attakapa warriors inhabited south Louisiana in 1805 (Swanton 1946).

The Chitimacha, members of the Tunica linguistic family, also are known to have inhabited both Bayou Teche and the Atchafalaya Basin at the time of French exploration (Swanton 1946; Usher 1989). During this period, they controlled much of the upper Barataria Basin along both Bayou Lafourche and the Mississippi River. Following unfavorable interactions with first European and then American colonists beginning as early as A.D. 1702, much of the Chitimacha population eventually was dispersed to inaccessible locations throughout the coastal region of the state. The Chitimacha continue to reside along Bayou Teche near present-day Charenton, Louisiana.

CHAPTER IV

THE PROJECT AREA IN HISTORICAL PERSPECTIVE

Introduction

The proposed project area contains both marine and terrestrial components. The marine component consists of a 4.3 km (2.7 mi) long corridor within the Vermilion River that the U.S. Army Corps of Engineers, New Orleans District, plans to dredge. The proposed area of dredging lies within the city limits of Lafayette, Louisiana. The terrestrial component of the project, a proposed disposal area for dredged material, is located below Milton, Louisiana, on the left descending bank of the river.

Colonial Era

During the colonial period, the study area was situated in an outpost of Louisiana known as the Attakapas District, a name derived from the Choctaw or Mobilian word for "eater of human flesh" (Kniffen et al. 1987:44). No evidence of cannibalism among the Attakapas, however, has been documented. Few colonists of European origin ventured into the district until the Acadians, uprooted from Canada, began migrating in 1765 to the colony of Louisiana.

The story of the Acadian expulsion from British-held Nova Scotia in the mid-eighteenth century is well known. Half of the Nova Scotia Acadians lost their lives in the forcible removal. The surviving inhabitants were dispersed. Their homes were burned, and they were rounded up, imprisoned, and placed on ships for uncertain destinations. For many, this odyssey included further imprisonment or rejection in other British colonies. Some of the refugees looked to French Louisiana as a new homeland where they could worship freely as Catholics, and where they could be reunited with the extended families that had been scattered in the expulsion.

By the time the first refugees arrived in New Orleans, Louisiana had been ceded to Spain. This change did not unduly discourage the refugees. They preferred Spain to England; at least Spain was Catholic. Spanish authorities (and miscellaneous French bureaucrats) welcomed the Acadians. There were some disappointments in store for the Acadians. Most significantly, Spanish policy dictated that the refugees settle in various disparate, specified areas. This requirement shattered all hopes for a new, united Acadia, and actually led to Acadian participation in a 1768 revolt. In general, however, the Acadians prospered in colonial Louisiana (Brasseaux 1987:73-89).

In Louisiana, Acadian pioneers ventured up Bayou Teche and then in 1766 advanced westward toward the Vermilion River. The upper Vermilion discouraged settlement since its low banks had a tendency to flood. The lower Vermilion proved to be much more popular. By 1778, 18 Acadian families had settled the prairies bordering the Vermilion between the modern communities of Lafayette and Abbeville. Since that time the vicinity of the study site has been inhabited continuously (Brasseaux 1987:95-96).

The earliest settlers in the vicinity of the Vermilion River came from the district of Chignecto in Nova Scotia, where the Acadians had engaged successfully in cattle raising. These immigrants selected homes in the grasslands of southwestern Louisiana where they could take up animal hus-

bandry again. Acadian herdsmen drove their cattle to market in New Orleans down a trail that ran parallel to Bayou Teche; today, Highway 90 approximates this route. Although they first drove cattle for other colonial landowners, the Acadians soon developed their own herds of Beaubassin beef cattle. By the 1780s, Acadian ranchers had emerged as the predominant suppliers of beef for the Crescent City slaughterhouses (Brasseaux 1987:122-124).

In the late eighteenth century, the Acadians of southwestern Louisiana concentrated on raising cattle rather than growing crops. Their agricultural efforts were intended for subsistence and home consumption rather than for the commercial market. As the ranchers raised more cattle they produced less corn, vegetables, and cotton (Brasseaux 1987:125).

Acadian settlers in the prairies did not adopt slaveholding so quickly as their Acadian counterparts along the Mississippi River. Nevertheless, by 1785, about 10 percent of the Acadians in southwestern Louisiana held slaves. The numbers of slaveholders increased until 1810, when more than half of the Acadian families in the prairies owned bondsmen (Brasseaux 1987:192-197).

The Patent Certificate to the Proposed Dredged Material Disposal Area, 1811

As a result of the Louisiana Purchase (1803), many changes occurred along the project corridor. The transition from Spanish to American ownership brought accelerated population growth and an increasingly diversified population. The United States also instituted a new system of land survey. As a result, landowners from the French and Spanish eras had to establish legal title to their property under the new American regime.

Although Pierre Darby, whose claim to the proposed dredged material disposal site was established by his heirs, bore an Anglo-American name, he had long been a resident in the colony of Louisiana. A 1770 census identifies him at the age of 22 in the household of his mother Marie Darby; the family (which included two younger brothers to Pierre) occupied a farm of five arpents on "the river below the city" (New Orleans). According to the census, the Darbys had 5 slaves, 7 cattle, 5 sheep, and 3 muskets (Voorhies 1973:218). Pierre Darby's pursuits eventually extended to the Attakapas district, where at least two persons bearing the Darby surname were recorded as settlers as early as 1785 (Feldman 1991:83). Before the Louisiana Purchase, Pierre Darby claimed the proposed dredged material disposal site in Section 50, of Township 11S, Range 4E, in the South Western District of Louisiana. When the land first was surveyed it contained two streams or coulees that joined together in Section 50 and then flowed into the Vermilion River. The upper coulee bore the name Anselm's Coulee for Anselm Thibodeau, the original patentee to Section 40. The lower coulee was named Darby's Coulee for Pierre Darby (Figure 10). Darby's Coulee today forms a part of the boundary between Vermilion and Lafayette Parishes. Darby died before the United States held hearings to establish the land title to the proposed dredged material disposal area. His heirs claimed Section 50, of Township 11S, Range 4E, and also Section 51 across the Vermilion River. While the claimants could not present complete patents from the Spanish or French governments, their heirs were able to present enough evidence to convince the American Commissioners of the legitimacy of Pierre Darby's claim. On January 1, 1811, Darby's heirs received from the Commissioners patent certificates to the land encompassing the proposed dredged material disposal area (and to the property on the opposite side of the Vermilion). Although Darby's heirs established their possession of Sections 50 and 51, the proceedings gave no indication that any member of the family actually occupied the site (Lowrie and Franklin 1834:2:804).

Changes in Southwestern Louisiana, 1803 - 1823

After the Louisiana Purchase, southwestern Louisiana underwent marked changes in terms of its political boundaries. The proposed dredging corridor and the proposed dredged material disposal site were encompassed by the newly created Attakapas County in 1805. Under county government, such Anglo-American institutions as jury trial, the English language, and the common law were introduced. Since the established inhabitants disliked these innovations, the legislative council soon replaced the county system with parish government. By this system the territorial governor appointed a parish judge who held and exercised the combined powers of county judge,

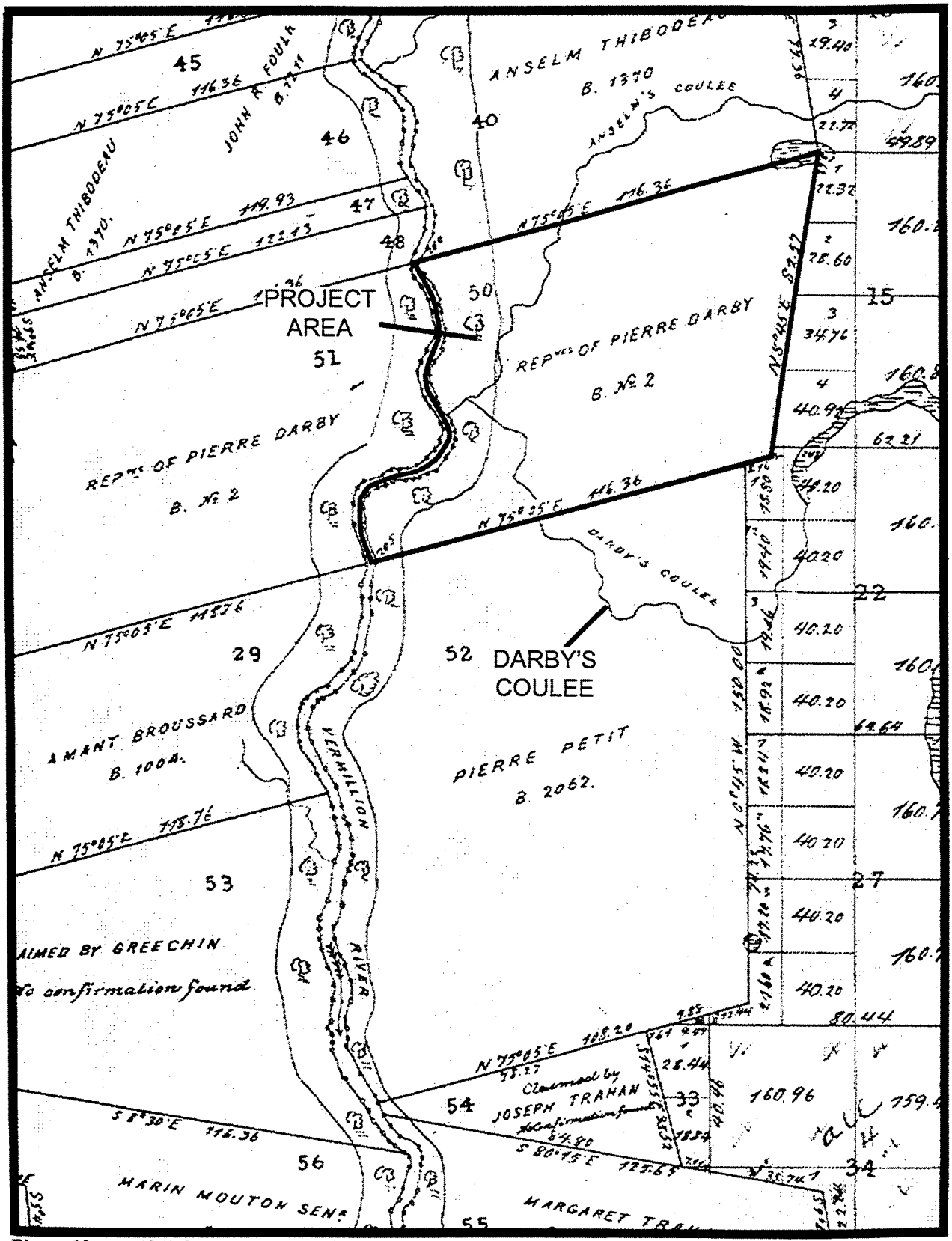


Figure 10. 1852 Surveyor General map depicting Darby's Coulee.

county clerk, sheriff, coroner, and treasurer. With the justices of the peace and a jury of 12 inhabitants he made policy and administrative decisions affecting police, taxation, and public works.

In 1807, Attakapas Parish was renamed St. Martin Parish. Subsequent changes included the creation of Lafayette Parish (1823) from the western part of St. Martin Parish; its territory included the proposed dredging corridor and the proposed dredged material disposal site (Griffin 1959:22-23).

The Struggle Over the Seat of Justice, 1823 - 1827

When it created LaFayette Parish in 1823, the legislature also established a commission to select a seat of justice. The commission chose a site at the so-called Pinhook (or Pin Hook) Bridge, where present day Louisiana Highway 182 crosses the Vermilion River, i.e., just above the riverine portion of the proposed undertaking. The Pinhook Bridge stood at the head of navigation of the Vermilion River (Griffin 1959:27). The origin of the name "Pinhook" has been much debated. Professor William A. Read suggests that the name was derived from "pinashuk," the Choctaw name for linden or basswood tree. According to persistent local legend, however, the name originated from an entrepreneur who used to steal chickens by catching them with a device similar to a fishing pole. A grain of corn on a pinhook served as bait; when the chicken swallowed the bait the ingenious chicken thief reeled in his prey (Griffin 1959:28). According to a third explanation, the bridge was called pinhook because it opened and closed like a pin to permit river traffic (Edmonds 1979:82).

Whatever the source of its name, the Pinhook Bridge was situated at the head of navigation of the Vermilion River, and the bridge preceded the establishment of the City of Lafayette. When the commission of 1823 selected a site near the bridge for the seat of parish government, John and William Reeves donated four arpents of land where the public buildings were to be erected. A jail was built, but the parish used a rented room near the bridge as a courthouse (Griffin 1959:29).

In the meantime, Jean Mouton formed a local faction in rivalry with the Reeves. Mouton had donated land for a Catholic church at some distance from the river. He then laid out a town around the church, offered to donate to the parish sites for public buildings, and lobbied the legislature to move the seat of justice to his land (Griffin 1959:30).

The legislature directed a parish election to decide in July 1824 whether to relocate the seat of justice. In this heated local controversy the Reeves family, landowners near the Pinhook Bridge, contended against the Mouton family, developers of land near the church. Although voters chose the site offered by the Mouton family, the Reeves did not accept their defeat graciously. Charging bribery and illegal voting by more than 50 persons, the Reeves proceeded to retract their previous land grant to the parish. Furthermore, the Reeves also commandeered the jail the parish had erected on the property. The parish then had to sue the Reeves family for the use of this public building (Griffin 1959:31).

A District Court in April 1827 confirmed the title to the disputed property at the Pinhook Bridge to the Parish of Lafayette. The decision infuriated the Reeves; they took their case to a higher court. Upon appeal, the state Supreme Court in the Western District at Opelousas reversed the decision of the lower court. The higher court ruled that by changing the seat of justice, the parish had dissolved the contract by which the Reeves had donated the land. The Reeves therefore reclaimed their property (and the improvements to it) legitimately. As a result, according to a historian of Lafayette Parish:

> The future town and parish seat was to grow up around Jean Mouton's church and not on the banks of Bayou Vermilion at Pin Hook as the Reeves family and its partisans had hoped (Griffin 1959:32).

Although the town grew up around the church rather than the bridge, the sprawling city of Lafayette today encompasses the site of Jean Mouton's church (now St. John's Cathedral) as well as the location of the Pinhook Bridge.

Antebellum Developments, 1827 - 1850

Cattle raising continued to prosper on the prairies of southwestern Louisiana through the first quarter of the nineteenth century. By 1827 cattlemen had registered more than 40 brands and identifying marks for livestock grazing in Lafayette Parish alone. Nevertheless, after 1830 ranching declined in relative economic impor-

tance; the prairie grasslands along the Vermilion River were plowed up and replaced with cotton and sugar cane. These crops often were cultivated by slave labor but on a comparatively small scale. The agriculturalists of the southwestern prairies had only modest farms when compared to the large sugar planters on the Mississippi River and the cotton planters on the Red River (Menn 1964:259-260 and *passim*). Cotton and sugar cane predominated in southwestern Louisiana during the antebellum period; the popularity of rice as a staple crop developed after the Civil War (Griffin 1959:105).

Snags made navigation difficult on the entire route of the Vermilion River, thus hampering the economic growth of the vicinity (Prichard et al. 1945:823-824). Steamboats eventually plied the waters, but submerged logs and stumps continued to present constant obstacles. Between 1840 and 1850, the police jury of Lafayette Parish appropriated more than $4,000.00, a large sum in those days, to remove obstructions in the Vermilion (Griffin 1959:86-88). The police jury's effort effected an improvement in navigation, at least temporarily. According to a local newspaper editor, who may have exaggerated, four or five steamboats engaged in regular trade at the Vermilion River's upper landing, the Pinhook Bridge, before obstructions once more clogged the river (Chief of Engineers 1887:2:1401). Whatever the case, periodic low water presented severe problems for the inhabitants of Vermilionville. Only barge service could be obtained at the Pinhook during frequent periods of low water (Griffin 1959:86-88).

The Proposed Dredging Corridor on the Eve of Civil War

The plantation system (consisting of staple crop production by a controlled labor supply) had developed along the proposed dredging corridor by the eve of the Civil War. A few hundred yards below the Pinhook Bridge, on a high bank overlooking the Vermilion River (on its right descending side), was Walnut Grove Plantation. Jean Sosthene Mouton had acquired this establishment when he married his cousin, Charlotte Mouton. Her father, Governor (and U.S. Senator) Alexandre Mouton had presented the property to the couple as a wedding gift. Reminiscences of the plantation and its environs were provided in the unpublished memoirs of the couple's son, Alexander Mouton. The unpublished memoirs were utilized extensively in the history of Lafayette Parish written by Alexander Mouton's son-in-law, Harry Lewis Griffin (Griffin 1959:39). The plantation included most of today's Bendel Gardens subdivision; the proposed dredging corridor flows by Walnut Grove's waterfront.

In 1860, on the eve of the Civil War, Sosthene Mouton owned 56 slaves. He produced cotton rather than sugar cane on his 900 ac (364 ha), 720 ac (291 ha) of which were improved. He valued his plantation at $18,000.00; he gave $28,800.00 as the estimated value of his personal property (which would have included the value of his slaves). Mouton owned 20 horses, 20 mules, 25 milk cows, 15 working oxen, and other cattle numbering 20. In 1860, his plantation produced 180 bales of cotton; each bale weighed 400 pounds. In addition, Mouton produced 3,000 bushels of Indian corn and 180 bushels of sweet potatoes that same year (Menn 1964:260-261). Unfortunately, the plantation house at Walnut Grove was burned by Federal troops during the Civil War (Griffin 1959:145).

Directly across from Walnut Grove, and also fronting on the proposed dredging corridor, stood Izidor Zenon Broussard's plantation. He cultivated cotton utilizing slave labor and he raised cattle, horses, and sheep. Broussard owned 56 slaves and his plantation produced 247 bales of cotton in 1860. Animal husbandry provided an important source of his income. He owned 50 horses, 13 mules, 44 milk cows, 28 working oxen, 250 sheep, 30 swine, and 200 head of cattle. He estimated the value of his livestock to be $4,440.00. From his sheep he produced 400 pounds of wool in 1860. Broussard owned 1,200 ac (486 ha) of improved land and 800 ac (324 ha) of unimproved acreage on the eve of the Civil War (Menn 1964:260-261).

Just below the proposed dredging corridor (and 5 km [3 mi] below the Broussard acreage) on the left descending bank of the Vermilion River stood the plantation of Honoré Beraud. He also kept a sawmill. Even though Beraud died of yellow fever in the epidemic of 1858, his plantation home survived well into the twentieth century (Griffin 1959:40, 57).

Above the proposed dredging area stood the Pinhook Bridge, a low wooden structure with a draw that could be opened to permit boats to pass. Jim Higginbotham's enterprises stood on

the right descending bank of the Vermilion River by the road to the bridge (between Walnut Grove and the highway). Higginbotham had his home there as well as a large warehouse and storage space that were utilized by steamboats and shippers. Higginbotham also kept a wheelwright shop nearby where he made hickory chairs with rawhide seats, spinning wheels, and similar articles. He also operated a lumberyard adjoining the warehouse (Griffin 1959:40).

When the traveler crossed the Pinhook Bridge to the right descending bank of the Vermilion River, he found Jim Higginbotham's enterprises on the left side of the road. On the right side of the road at the bridge stood William Butcher's saloon and billiard parlor, a popular place of recreation and refreshment during the antebellum period. Proceeding down the Pinhook Road towards the town of Vermilionville, the traveler next encountered on the right side of the road (just beyond Butcher's Saloon) the restaurant of Louis Grangé, famous for its chicken pies. Farther down the road, on the left hand side (just beyond the Higginbotham property) stood the house and shop of John Baumgartner, who made cypress cisterns, hogsheads, and molasses barrels that he in turn sold to the planters. An elderly man with no family, Baumgartner was cared for by his housekeeper, Mammy Barah. Much beloved in the community, she cultivated a large vegetable garden and kept a peach orchard noted for its delicious clingstone peaches (Griffin 1959:40).

Civil War in the Proposed Dredging Corridor Vicinity

A native of Lafayette Parish, former Governor Alexandre Mouton presided over Louisiana's convention of January, 1861 in which delegates voted overwhelmingly to secede from the Union. At least initially, Lafayette Parish enthusiastically supported the formation of the Confederate States of America, but some local patriotism abated when the Pelican State was subjected to a Federal invasion. In April, 1862, New Orleans fell to the United States, and by the spring of 1863 General Nathaniel Banks was advancing up the Bayou Teche toward the proposed dredging corridor with 20,000 Federal troops. A much smaller group of Confederates, commanded by General Richard Taylor, contested the Federal advance. The Confederates fought effectively but were forced to retreat.

After capturing New Iberia and destroying the salt works on Avery Island, the Federal commanders divided their invading army. The Union left proceeded from New Iberia directly to the Pinhook Bridge over the Vermilion River below Vermilionville (modern Lafayette). The Union right advanced up the west bank of the Bayou Teche to St. Martinville; from there the Federal troops crossed over to the Vermilion River and to the Pinhook Bridge (Raphael 1975:141).

On April 17, 1863, the Federal left, on a direct route from New Iberia to Vermilionville, arrived first at the Pinhook Bridge as General Taylor and the last of his supply wagons crossed the river. Located just above the area of the proposed dredging corridor, the bridge was situated in the approximate point where present day Louisiana Highway 182 crosses the Vermilion River, i.e., to the west of Pilette (Edmonds 1979:83). As the Confederates' last wagon reached the other side, Taylor ordered the bridge destroyed. After the Confederates set the bridge ablaze, they positioned their infantry and artillery around its upper approaches to engage the advancing Federal forces. The two armies struggled for about four hours but with few casualties on either side. When Taylor was satisfied that most of the Confederate troops and their wagon train had proceeded onward to safety, the Confederate general withdrew his rear guard from the bridge.

The Federal army constructed a pontoon bridge the next day in order for their forces to pursue the retreating Confederates. While waiting for the construction of the bridge, almost half the tired and dirty Federal troops stripped off their clothes and jumped into the river. Considerable confusion resulted when a troop of Taylor's Confederate cavalry swooped down to the opposite bank and opened fire on the naked men. One observer described the scene:

> Such a spectacle never before was seen. The long [drum] roll was sounding and naked men, in every direction, were making a dash for their guns, trying to dress as they ran. Some with their trousers on hind side before; didn't know whether they were advancing or retreating (Raphael 1975:147, quoting [?] Irwin).

The invasion of the Teche in the spring of 1863 provided no strategic victory for the Federal cause. The army was withdrawn in the summer to besiege Port Hudson on the Mississippi River. In the Autumn of 1863, however, Federal troops once more advanced up the Teche, this time in an overland expedition intended to plant the United States flag in Confederate Texas. The citizens of the Teche were dismayed by the return of the Federal troops. To be twice invaded inflicted especially severe hardship on the civilian population.

At New Iberia, the Federal invasion force took the stagecoach road across the prairies to Vermilionville. On October 9, 1863, as the Federal invaders approached the Pinhook Bridge over the Vermilion, they found the span ablaze once more. The bridge had been rebuilt since its burning in the spring, but the Confederates again destroyed the structure to slow the Federal advance. At 11 a.m. the Federal forces attacked, and a skirmish ensued (Jones 1961:320; Figure 11). The fighting occurred above the proposed dredging corridor. Like its predecessor, the second Pinhook Bridge was located where present day Highway 182 crosses the Vermilion (Edmonds 1979:83).

According to one Confederate from Texas, "We withdrew in brisk fashion" (Edmonds 1979:86). In the engagement, Federal troops secured a bloodless victory for the Union. They once more replaced the destroyed Pinhook Bridge with a temporary span (Edmonds 1979:90). The Federal army then pursued the Confederates to Opelousas, which the Union forces occupied until the end of October (Winters 1963:297-298).

The Post-Civil War Era

The social, political, and economic effects of the Civil War on the South were severe. For much of the South, violence and bitterness on the part of many southern whites marked the years of Reconstruction. Besides the upheaval in their political life, with many former slaves enfranchised as voters, Southerners had to find a way to conduct business in a cash-poor economy; agriculturalists in particular had to find a way to pay former slaves for their labor. The systems of tenant farming and sharecropping emerged in response to these needs, and they were in place by 1868.

Sugar cane cultivation along the Teche and the Vermilion revived in the postbellum era. Nevertheless, sugar producers in the vicinity of the project area did not prosper. Sosthene Mouton produced 85 hogsheads of sugar in 1881; V. Broussard (heir to Izidor Zenon Broussard) reported an output of only 27 hogsheads in that year. Both planters used the old-fashioned kettle system in their sugar houses. Horses rather than steam provided the power. By 1890, both plantations had ceased sugar production altogether (Bouchereau 1881:6; 1890:2).

Before the Civil War, most planters had their own sugar houses. In the postbellum period, the processing of cane became more centralized. With the economy in shambles and many sugar houses destroyed, planters began to send their cane elsewhere for processing. The result was fewer sugar houses, but much greater sugar production, since the newer sugar houses were more efficient than their antebellum predecessors. This trend continued into the twentieth century.

A prominent example of this trend occurred at Youngsville. Roy O. Young, who at one time owned the proposed dredged material disposal tract, organized a factory there in 1907. The factory originally was built for manufacturing syrup, but added sugar production in 1909. In 1910, it was reorganized as the Youngsville Sugar Factory with capital of $150,000.00. The capacity of the plant was increased to 1,000 tons of sugar cane daily and it continued to grow through the first half of the twentieth century (Griffin 1959:107).

Communities Near the Proposed Dredged Material Disposal Area

The Town of Milton is situated near the proposed dredged material disposal area. Settlement occurred in the vicinity of Milton as early as 1823, the year Lafayette Parish was established, but the town dates from after the Civil War. John Cushman, who settled there ca. 1870, named the town for his younger brother, Milton Cushman, a physician who practiced medicine for many years in New York City.

Although located at some distance from the site, Youngsville has had a special relationship to the proposed dredged material disposal item. The town first was settled about 1831 and was laid out in 1839. Originally named Royville, the

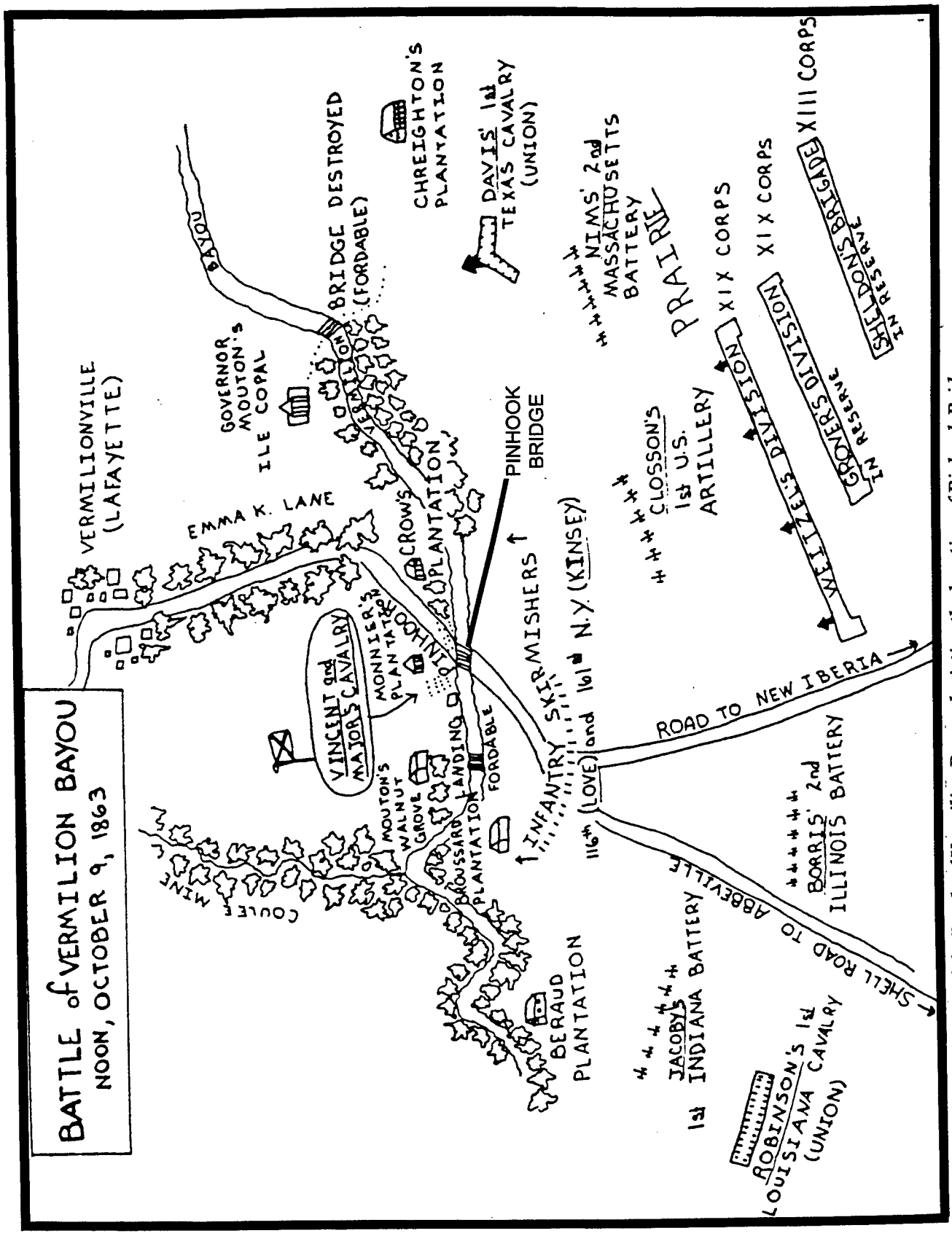


Figure 11. Illustration of the Battle of Vermilion Bayou depicting the location of Pinhook Bridge.

town was incorporated as Youngsville in 1883. Its population of 100 at incorporation grew to 500 by 1920 and 769 by 1950 (Griffin 1959:73-74). By 1990 Youngsville reported a population of 1,195 (Calhoun 1995:158). By 1832, Roy O. Young of Youngsville, a prominent local entrepreneur, also owned most of the proposed dredged material disposal area, i.e., Section 50, of Township 11S, Range 04E (Smith 1932).

The Proposed Dredged Material Disposal Area during the Postbellum Era: The Picard Cemetery, 1865 - 1993

Auguste Picard, a widower, owned the proposed dredged material disposal area during the Civil War era. When his wife, Francoise Eleonore Philippine Jeune Picard died on July 4, 1865, she was buried in a family cemetery that Auguste Picard created beside the Vermilion River and within the boundaries of the project item (Figure 12). Hers was the first interment that can be documented in the burial plot. In 1880, Auguste was buried beside her. Although rightly called the Picard Cemetery, it served the neighborhood as well as the family. In striking contrast to most cemeteries in the racially segregated late nineteenth century southern region, the burial ground eventually included the tombs of both blacks and whites. When representatives of the Lafayette Genealogical Society attempted to document the cemetery in 1993, they found 343 burial sites (Figures 13 and 14). The majority of the graves remain unmarked, and the surviving tombstones are in extremely poor condition (Bourque and LeBlanc 1995:54).

Postbellum Developments at the Proposed Dredged Material Disposal Site

After his wife's death, Auguste Picard conducted a family meeting and on September 11, 1866, mortgaged the land encompassing the proposed dredged material disposal area in favor of his five minor children. Known as a minor's mortgage, this legal document enabled Auguste to obtain money from the estate that his children eventually would inherit from their mother's succession (Lafayette Parish Clerk of Court, Mortgage Book K, Folio 448, Entry 4592).

Adolphe Picard, son to Auguste, succeeded his father as owner of the parcel. It remained in his hands until March 22, 1915, when three locally prominent men, Roy O. Young, P. A. Duploix, and the Reverend Johanni Roquet, acquired the property. As previously mentioned, Roy O. Young had established a large molasses and sugar factory in Youngsville (1907). The Duploix, Dupleix, or Duplex family of Youngsville was engaged in importing wine from Bordeaux, France. Father Roquet in 1903 had inaugurated a successful movement to build a Catholic Church in Broussard; the church was completed in 1904 (Griffin 1959:78-79, 107, 125).

A plat of 1932 depicts the proposed dredged material disposal area as: "property of R. O. Young & the Est. of Rev. J. Roquet" (Figure 15). The plat indicated that Anselm's Coulee had been transformed into a canal. A road covered much of the boundary between Section 40 and Section 50, and the Picard Cemetery occupied the two arpents situated beside the Vermilion River and in the southwestern corner of Section 50. The plat also depicted a residence and a barn east of the canal; a servitude road provided access to these structures from the South (Smith 1932).

Evariste Bourque acquired the proposed dredged material disposal tract on September 4, 1948. Victoria Bourque has resided on the property since 1949; Miss Bourque acquired title from Evariste in 1982. She operates a cattle farm at the site (Victoria Bourque, 1998, Personal communication).; two modern residences and several outbuildings associated with the cattle farm are situated in the northeast corner of the proposed dredged material disposal area.

The Proposed Dredging Corridor in the Postbellum Era

The plan for a rail connection between New Orleans and Vermilionville (Lafayette) was revived in the postbellum era. After many delays and difficulties the line reached Vermilionville in 1880. A railroad bridge was built across the Vermilion about three miles above the Pinhook Bridge, which remained the head of navigation on the river (Chief of Engineers 1881:2:1281). The railroad helped the community to emerge from the poverty that it had experienced since the Civil War. Links to railroads to the west of Lafayette also were established so that by 1883 the town was connected to San Antonio, Texas, where

Figure 12. West view of Picard tombstone.

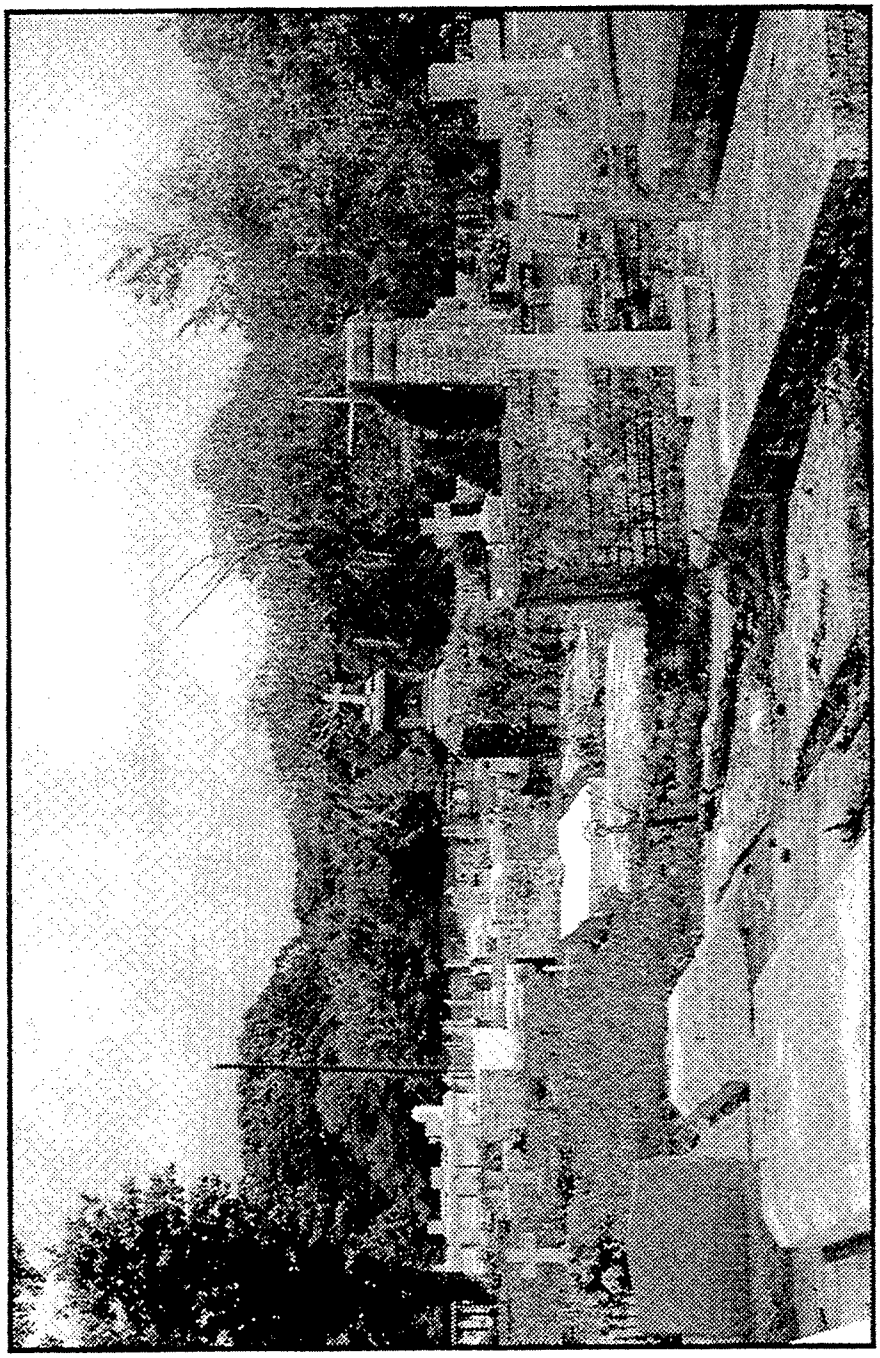


Figure 13. West view of the southeast corner of Picard Cemetery.

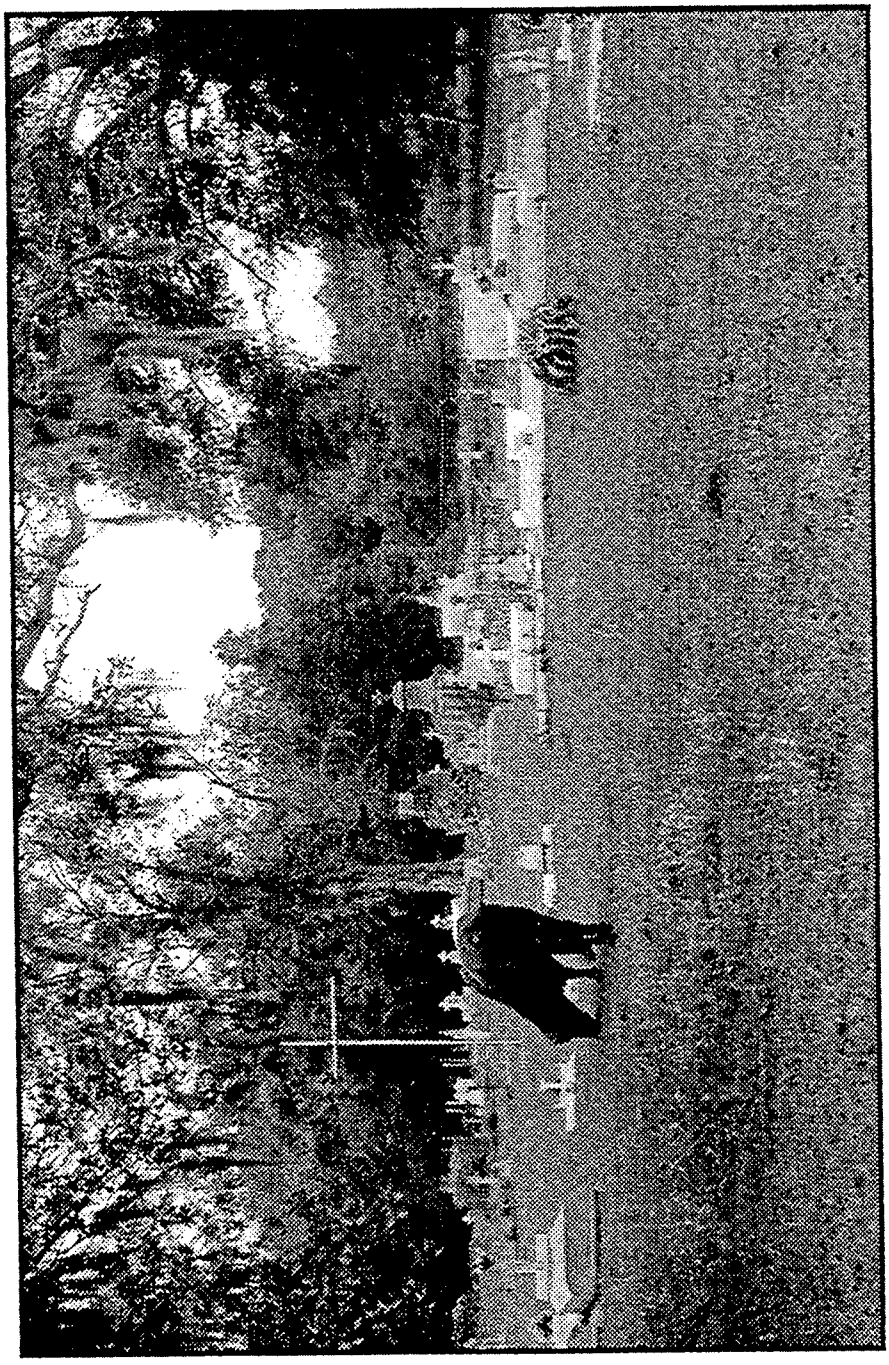


Figure 14. Southeast view of Picard Cemetery.

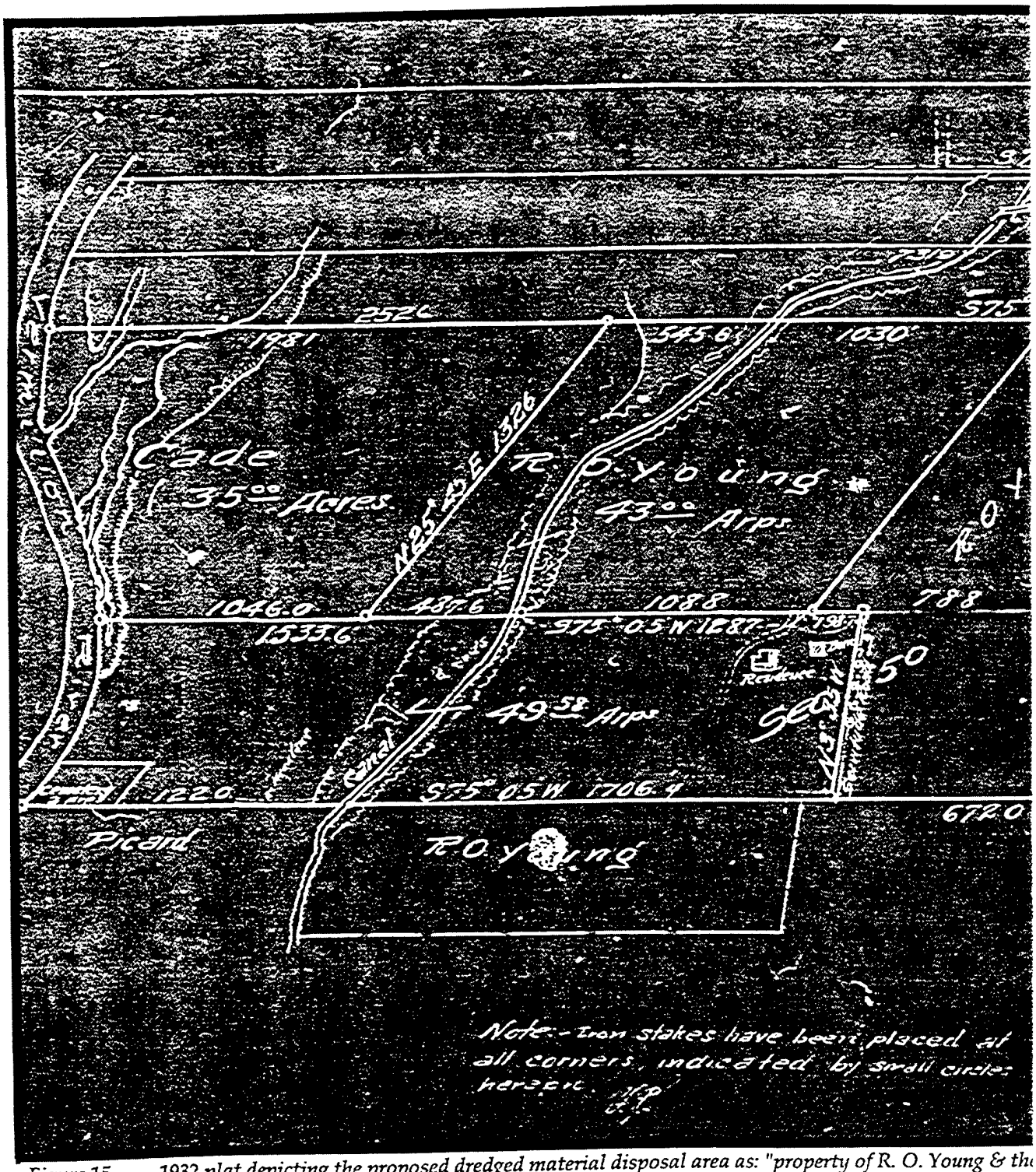
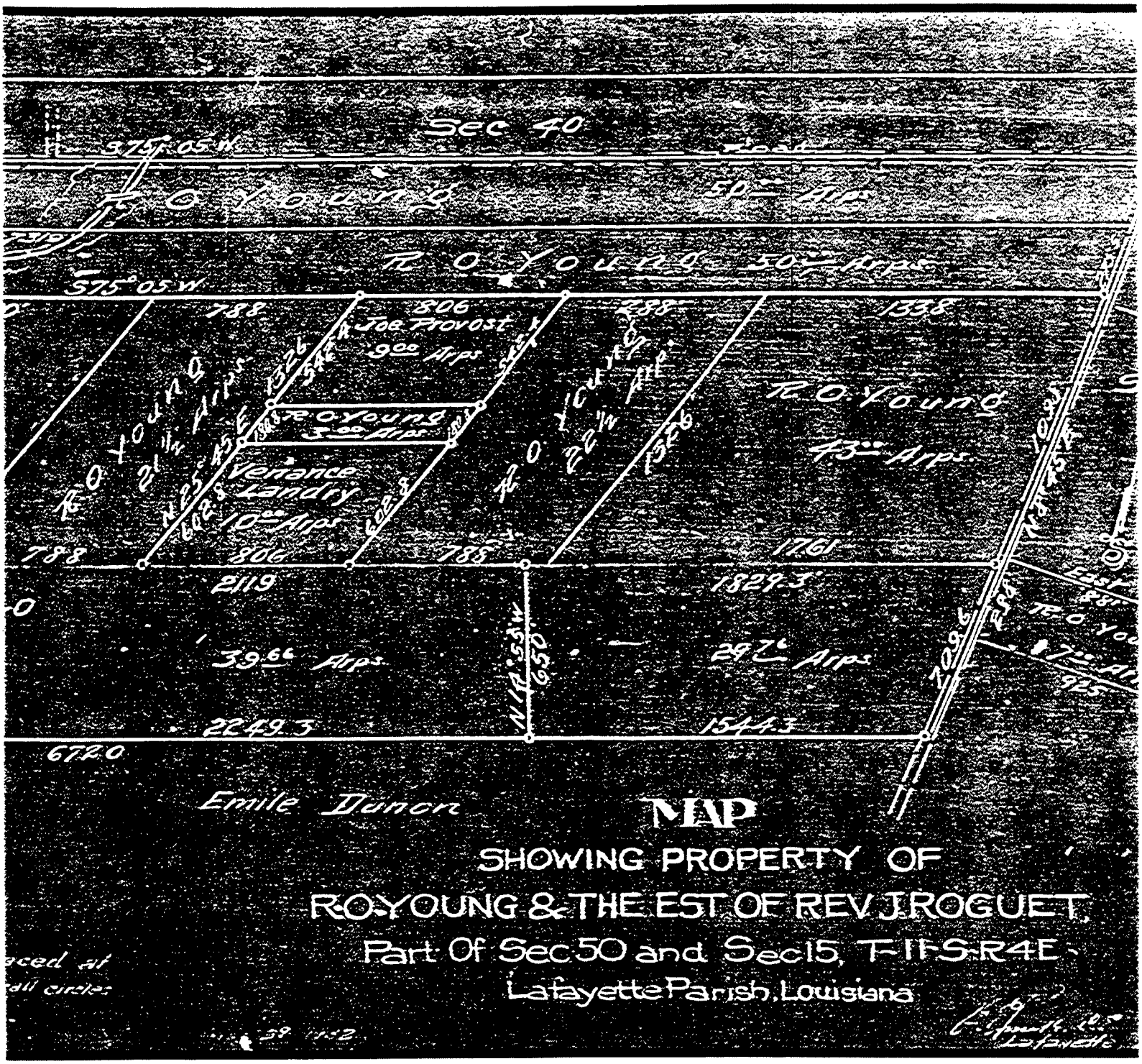
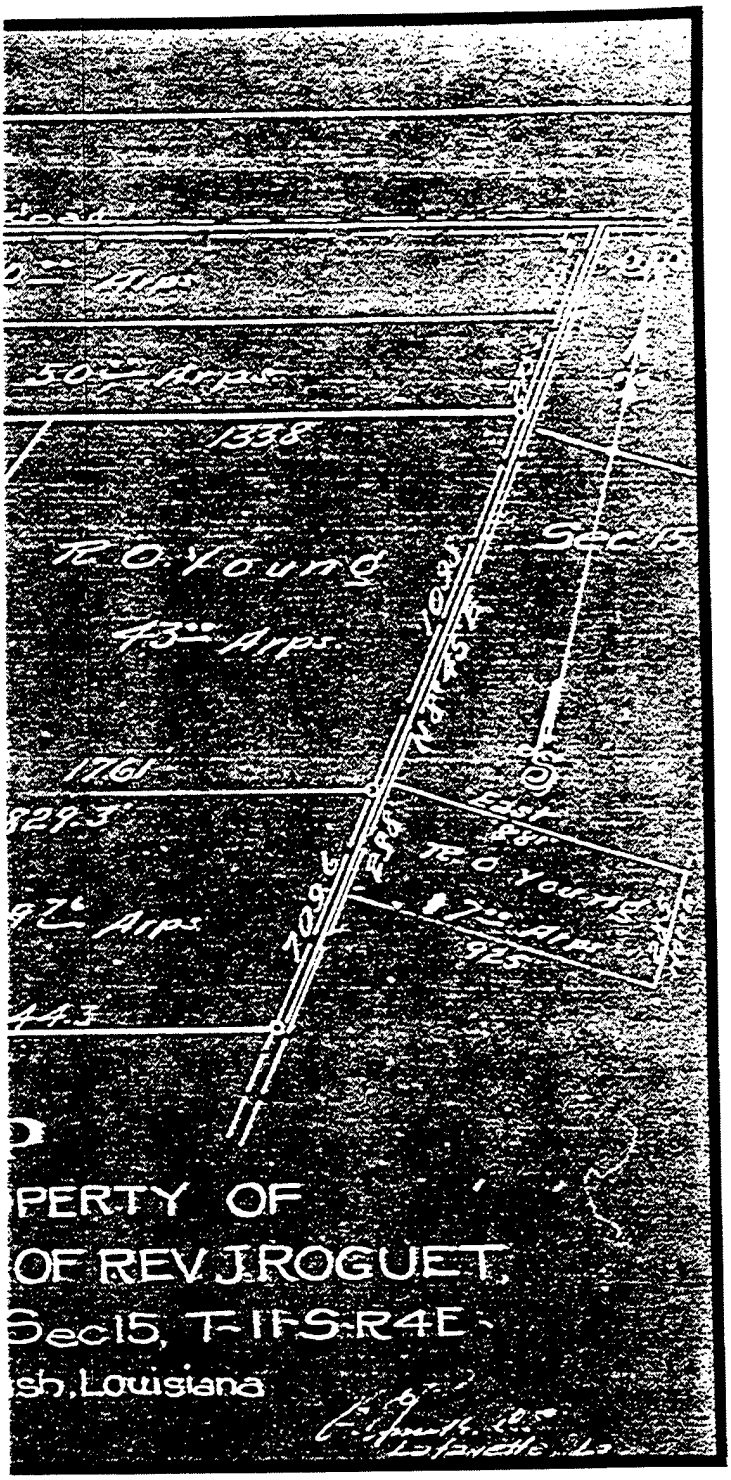


Figure 15. 1932 plat depicting the proposed dredged material disposal area as: "property of R. O. Young & th



O. Young & the Est. of Rev. J. Roquet."

(2)


1338
R.O. Young
43 Acres
1761
829.3'
92 Acres
Sec 15
R.O. Young
PERTY OF
OF REV J. ROGUET.
Sec 15, T-11-S-R4E
sh, Louisiana

(3)

travelers could disembark and, after a day's delay, take a train to San Francisco, California (Griffin 1959:88-89).

The Vermilion River did not compete successfully with the railroad nor did shipping on the river work in tandem with the new rail network. Navigation on the Vermilion continued to present many problems.

The federal government did not undertake maintenance of the Vermilion River in the antebellum period. As previously mentioned, the police jury of Lafayette Parish had to subsidize snag removal on the river in the 1840s (Griffin 1959:86-88). In 1880, however, Congress appropriated $5,000 to improve the Vermilion from the new railroad bridge at Lafayette for 22 miles downriver (thus encompassing the project corridor and the dredge disposal site). G. A. Meyer, a private contractor, undertook the work (Chief of Engineers 1881:2:1281-1282).

In 1886, the Federal Government authorized a preliminary examination of navigation on the Vermilion from Abbeville up to the railroad bridge at Lafayette. O. T. Crosby, First Lieutenant of Engineers, made the examination. He found, first of all, that the work conducted in 1881 was "done by contract, and, so far as I can learn, not well done" (Chief of Engineers 1887:2:1399). He observed that the *Barmore*, a steamer of considerable size, had difficulty entering the Vermilion across a bar at the foot of the stream. Nevertheless, after crossing the bar, the steamer, which drew three feet, could proceed up the Vermilion for 15 miles above Abbeville, although it could not reach the project corridor. Running under contract to the Southern Pacific Railroad, the *Barmore* delivered freight to the railroad and was losing money in the effort.

The *Josephine Spengler*, a smaller craft, could proceed a few more miles upstream, from Abbeville toward the project corridor, but only "a very small tug-boat, drawing barges," could reach the Pinhook Bridge (Chief of Engineers 1887:2:1399).

Lieutenant Crosby reported that in the early 1880s a small steamboat of about the same dimensions (100 feet long by 25 foot beam) as the *Josephine Spengler*

> ran over the whole of this section, delivering goods at Pinhook Bridge, then running out of the Vermillion [sic] along the Gulf coast to the Atchafalaya, thence to the head of the Atchafalaya, then down the Mississippi to New Orleans. This trip, something like 550 miles in length, was made in opposition to the railroad, the distance [by rail] from Lafayette to New Orleans being 144 miles. The steamboat, working at such disadvantage, could not maintain its cause (Chief of Engineers 1887:2:1399).

Furthermore, when the little steamboat ceased operations, snags clogged the river again.

Examining the river from 15 miles above Abbeville to the Pinhook Bridge, Lieutenant Crosby found 350 obstructions in the stream and 250 overhanging trees that impeded navigation. The area from the project corridor up to the Pinhook Bridge contained the most obstructions. The clearing of these obstructions would enable vessels of no more than three foot draft and about 20 foot beam to ascend the Vermilion to the Pinhook Bridge (Chief of Engineers 1887:2:1399).

According to Lieutenant Crosby, 3,800 bales of cotton would be shipped annually on the Vermilion if the river were improved. The Abbeville vicinity also shipped about 5,000 dozen eggs to New Orleans every month. Improvement of the river also would facilitate the delivery of the mail, which at that time was sent by stage coach from the railroad at New Iberia to Abbeville.

Nevertheless, Lieutenant Crosby had to weigh these aforementioned advantages against the disadvantages of improving the Vermilion. He wrote:

> As a general commercial route, Bayou Vermillion, from Abbeville to the railroad bridge [at Lafayette], is not of national importance, or worthy of improvement in the sense in which I understand those words to have been used in legislation on the subject (Chief of Engineers 1887:2:1399).

Major W. H. Heuer, Lieutenant Crosby's superior officer in New Orleans, agreed with his subordinate's conclusions. Major Heuer determined that:

> The improvement, if made, would be purely local and not permanent . . . Considering the present demands of commerce, this bayou is, in my opinion, not worthy of improvement (Chief of Engineers 1887:2:1398).

By 1890, another railroad, the Iberia and Vermilion Railroad, connected New Iberia with Abbeville, in Vermilion Parish. Like the New Orleans to Vermilionville line, the Iberia and Vermilion Railroad was absorbed by the Southern Pacific Railroad system (Iberia Parish Development Board [1948]:69-70.

The railroads continued their adverse effect on transportation on the Vermilion River, but Congress in 1892 authorized the expenditure of $25,000 to deepen the Vermilion's channel to five and a half feet from Vermilion Bay to the railroad bridge at Lafayette. The tonnage on the river consisted principally of sugar cane, rice, and miscellaneous merchandise. Sugar cane comprised 82 percent of the total. The shipment of cane required vessels of a draft of four feet to four feet six inches. Rice comprised about 11 percent of the tonnage; it required vessels with a draft of three feet to three feet six inches (Chief of Engineers 1917:1:930-932).

In spite of these improvements to navigation, at least for Lafayette Parish, the railroad car provided a more dependable means of transportation than the steamboat or other vessel. Louisiana's railroads experienced their maximum growth in 1910. They thereafter began to decline due to the popularity of automobiles and to improved highway systems.

In Lafayette Parish, the City of Lafayette in 1915 sponsored the first attempt to replace dirt roads with gravel surfaced thoroughfares. In 1918, a $300,000.00 bond issue in Lafayette Parish financed a system of gravel roads that connected Lafayette with the seats of all adjoining parishes. The state and federal government added $200,000.00 to this roadbuilding effort (Griffin 1959:89-90).

During the late 1920s gravel roads were considered inadequate for the burgeoning automobile-owning population. Consequently, Governor Huey Long in 1928 proposed a 100 million dollar statewide bond issue to "lift Louisiana out of the mud." The residents living in the vicinity of the proposed dredging corridor heartily approved of the Governor's plan. Implementation of the program had an important influence on southwestern Louisiana. The hard surface road connecting Lafayette to Breaux Bridge was completed in 1932 as a result of this bond issue. State funds were contributed to construction of a federal highway, U.S. 90 -- it was completed in 1931 (Griffin 1959:89-90).

In 1944, federal engineers once more began dredging the Vermilion River from its mouth to Lafayette in order to improve navigation on that stream. They dredged the waterway to a depth of 2.7 m (9 ft) and a width of 30.5 m (100 ft) (Griffin 1959:90-91).

Nevertheless, a survey of Lafayette Parish in 1953 reported that no regularly scheduled lines plied the river: "Only traffic is for B & B Towing Co., an occasional barge of pipe, gravel or sand" (Lafayette Parish Development Board 1953:97).

On August 15, 1940, hurricane rainfall precipitated the most serious flood in Lafayette Parish in modern times. The river registered 19.6 feet above sea level at Highway 43 on the Vermilion. Many areas of Lafayette Parish flooded in the deluge (Lafayette Parish Development Board 1953:47).

Water pollution has presented an increasing threat in the project corridor as the nearby population has expanded. The Vermilion always has been a sluggish stream, and downstream flow diminishes in the vicinity of Lafayette. In the late summer and early fall, the river virtually stagnates. Flow is sluggish and can move either upstream or downstream. According to a study undertaken in 1980:

> When flow lessened, waste inputs from the urban area degraded the water quality in the stagnant reach downstream from Lafayette, primarily through accumulations of nutrients, organic carbon, and biochemical oxygen demand (Demchek and Leone 1983:1).

In the meantime industrialization, urbanization, and agriculture impose increasing demands upon the river not only in the late summer but year round.

The vicinity of the proposed dredging corridor remained a series of cane, cotton, and cornfields until 1900 (Griffin 1959:57). The establishment nearby of Southwestern Louisiana Institute in 1901 had an important influence on the development of the city and Lafayette Parish. Other significant influences on economic growth included the completion of the railroad network; the establishment of banks and building associations, 1891-1906; the paving of highways leading

to Lafayette by 1936; and the arrival of oil companies in 1940. Attracted by Lafayette's central location and its hospitality to industry, oil companies moved into the community with lease men, production men, field supervisors, geologists, engineers, marketing supervisors, as well as with numerous individuals and companies involved in support services. In 1952, an oil center was established between Pinhook Road and Girard Park, not far from the area that encompasses the proposed dredging corridor. According to one local historian, "Thus began the move that has made Lafayette the oil center of all South Louisiana and has changed the face and character of the city" (Griffin 1959:114).

CHAPTER V

PREVIOUS INVESTIGATIONS

Introduction

This chapter provides background contextual information about previous archeological investigations conducted in the vicinity of the project area. Additionally, this chapter was designed to assist in the historic preservation planning process by ensuring that any previously recorded cultural resources located within the project area were relocated during fieldwork. The chapter contains a review of all cultural resources investigations completed within 8 km (5 mi) of the current project area as well as a review of each previously recorded archeological site located within 1.6 km (1 mi) of the proposed project reach. This review was based on a background search of data currently on file at the Louisiana Department of Culture, Recreation and Tourism, Office of Cultural Development, Division of Archaeology, in Baton Rouge.

Both the quantity and quality of information regarding the sites located in the vicinity of the project area are reflected in this document. These data (site type, site function, temporal setting, and significance status) were useful aids in extrapolating the number and types of cultural resources that could be anticipated during the Phase I cultural resources survey and archeological inventory of the proposed project area.

A review of the Louisiana site files identified eight cultural resources investigations within 8 km (5 mi) of the project area (Table 1). Only three archeological sites have been recorded within the immediate vicinity, i.e., 1.6 km (1 mi) of the proposed project area (Table 2; Figure 3). These surveys and sites are discussed below.

Previously Recorded Archeological Investigations Conducted within 8 km (5 mi) of the Proposed Project Area

Jon L. Gibson of the University of Southwestern Louisiana undertook a Phase I cultural resources survey for the U.S. Army Corps of Engineers, New Orleans District, from April to July of 1975, in anticipation of planned maintenance and operation programs which included locations along Bayou Teche, the Vermilion River, and Freshwater Bayou, in south central Louisiana.

Investigations included archival research, visual examination of the bank lines from a boat, and pedestrian survey of judgmentally selected areas along the banks and levees. These "spot checks" were placed no more than 400 m (1,312.34 ft) apart when possible. If no artifacts were recovered during pedestrian survey, small "trowel-sized" subsurface tests were conducted to unspecified depths. The assorted pedestrian surveys extended 100 m (328.08 ft) out from the existing bank line. Material deposited from past dredging activities and the construction of private residences along the banks of these rivers, however, probably obscured a number of archeological sites. Despite these disturbances, 38 archeological sites were identified. The sites consisted of 34 prehistoric sites and four sites with both prehistoric and historic components. Nearly all of the sites, 35 of the 38 sites visited, were located adjacent to the Vermilion River. Only three sites were recorded along Bayou Teche and no cultural resources were identified along Freshwater Bayou. National Register of Historic Places evaluations were not provided

Table 1. Archeological Investigations Conducted within 8 km (5 mi) of the Proposed Vermilion Project Area.

TITLE AND AUTHOR(S) OF REPORT	REPORT NUMBER	INVESTIGATION METHOD	RESULTS OF SURVEY
Archaeological Survey of Bayou Teche, Vermilion River, and Freshwater Bayou, South Central Louisiana (Gibson 1975)	22-105	Archival research, pedestrian survey, and small trowel-size subsurface testing	38 sites were visited; 22 were considered ineligible, 16 were considered eligible for nomination. Recommendations for avoidance or mitigation of the eligible sites, and for monitoring during work at ineligible sites.
The Texas-Louisiana Ethylene (TLP) Project (McIntire 1978)	22-366	Archival research, helicopter, boat, vehicular, and pedestrian survey, and excavation of shovel and auger tests	The O'Brien Site and Site AC21 were identified within the pipeline corridor. Neither of these two sites is located within 1.6 km (1 mi) of the currently proposed project area.
Cultural Resources Survey of Sewage Force Mains, Pump Stations, and Treatment Facility, Village of Youngsville, Lafayette Parish, Louisiana (Gibson 1978)	22-367	Archival research, and vehicular and pedestrian survey	No cultural resources were recorded.
An Archeological Reconnaissance of Supplemental Area #3, Lower Bayou Teche Watershed, Lafayette and Vermilion Parishes, Louisiana (Price et al. 1978)	22-418	Archival research, pedestrian survey and shovel and auger testing	Three sites, NLU-78-174 - NLU-78-176, were recorded; none of these sites falls within 1.6 km (1 mi) of the currently proposed project area.
A Cultural Resources Survey of Coulee Ile Des Cannes, Lafayette Parish, Louisiana (Whelan 1986)	22-1120	Archival research, pedestrian survey, and shovel testing	Three previously recorded sites were revisited (16LY1, 16LY7, and 16LY51), and no new cultural resources were recorded.
Atlas and Report on Prehistoric Indian Mounds in Louisiana, Volume IV, Acadia, Lafayette, and St. Landry Parishes (Jones and Shuman 1991)	22-1680	Archival research, pedestrian survey, local interviews, and mapping	35 mound sites were visited, no new cultural resources were recorded. No assessment of eligibility or recommendations were made. Research potential for the 30 sites was ranked either as Good, Fair, or Poor.
A Cultural Resources Survey from Sorrento, Louisiana to Mont Belvieu, Texas (Skinner et al. 1995)	22-1926	Archival research, pedestrian and vehicular survey, and shovel testing	No cultural resources were recorded.
Addendum to Beyond the River and the Ridge: Cultural Resources Investigations of Ambassador Caffery Parkway, Lafayette Parish, South-Central Louisiana: Alternates C, D, G, K, and L (Gibson and Brasseaux 1997)	22-1927A	Archival research, pedestrian survey, and shovel testing	Site 16LY81 was identified, and it was assessed as not significant. No additional testing of the site was recommended. The site does not fall within 1.6 km (1 mi) of the currently proposed project area.

Table 2. Archeological Sites Located within 1.6 km (1 mi) of the Proposed Vermilion Project Area.

SITE NO.	USGS 7.5' QUAD AND UTM LOCATION	CULTURAL AFFILIATION	DESCRIPTION	TESTING	NRHP ELIGIBILITY	RECORDED BY
16LY23 (Lee Picard Site)	Lafayette Zone 15 589880E 3329100N	Late Archaic Period or nascent Poverty Point Period	Prehistoric site of unknown function	Surface collection	Not assessed	Gibson 1975
16VM124 (Beverly Picard Site; USL 16VM17)	Lafayette Zone 15 589250E 3327990N	Paleo-Indian Period	Prehistoric site of unknown function	Surface collection	Not assessed	Gibson 1975
16VM125 (Archie Picard Site; USL 16VM11)	Lafayette Zone 15 588930E 3327790N	Plaquemine Period, ca. 1200 A.D.	Base camp or village	Surface collection	Not assessed	Gibson 1975

for individual sites, but a segment of the Vermilion River from 2.0 km (1.2 mi) south of Long Bridge (Highway 94, Lafayette to Breaux Bridge) south to the Surrey Street Bridge in Lafayette was recommended eligible as a National Historic Archeological District. No historic structures survey was undertaken during the course of these investigations.

During January and February of 1978, McIntire conducted a Phase I cultural resources survey and archeological inventory of the proposed Texas-Louisiana ethylene (TLP) pipeline (1978; #22-366). The then-proposed right-of-way corridor measured approximately 386 km (240 mi) in length and it paralleled existing pipeline corridors for the majority of its length. The pipeline originated in Mont Belvieu, Texas and it terminated at the Napoleonville and Bayou Choctaw domes in Louisiana. It was not noted in the survey report on whose behalf the investigations were performed; however, the survey was coordinated with the Texas Archeological Survey of the University of Texas at Austin; the Chambers County Historical Survey Committee; and the Louisiana Department of Culture, Recreation & Tourism, Divisions of Archaeology and Historic Preservation.

Cultural resource investigation of the proposed pipeline corridor included pedestrian, vehicular, helicopter, and boat survey. During pedestrian survey of the then-proposed pipeline corridor, an unspecified number of shovel and auger tests were excavated. The pedestrian survey focused on areas where the planned right-of-way converged with streams or natural levees and at valley wall contacts between estuaries or river flood plains and Pleistocene bluffs. Although a number of archeological sites were recorded or relocated, only two sites fell within the direct boundaries of the proposed right-of-way. Previously recorded site 16AC21 and the newly recorded O'Brien Site (at the time the report was written, a site number had not been assigned) were characterized as small, prehistoric earth middens. No significance assessments were provided; however, it was recommended that additional testing be completed to determine the horizontal and vertical extent of the sites prior to considering any mitigation procedures. In addition, McIntire recommended that the planned pipeline corridor be rerouted to avoid the two archeological sites (McIntire 1978); neither of the sites is located within 1.6 km (1 mi) of the currently proposed project area.

Gibson conducted a cultural resources investigation of a number of proposed pump stations, sewage force mains, and a treatment facility at various locations in Youngsville, Lafayette Parish, Louisiana (Gibson 1978; #22-367). The survey was performed on behalf of Domingue, Szabo, and Associates, Inc., and the Village of Youngsville, on February 19, 1978. A records review failed to identify any archeological sites within the vicinity of the planned project items. As a result of both vehicular and pedestrian survey, a small concentration of modern artifacts was recovered. The report does not state if the cultural material was recovered from shovel tests or from surface contexts; Gibson does note, however, that no significant cultural resources were recorded. No additional testing of the proposed project items was recommended.

At the request of the Soil Conservation Service (Alexandria, Louisiana), Heartfield, Price and Greene, Inc., performed a Phase I cultural resources survey of Supplemental Area #3 of the Lower Bayou Teche Watershed, Lafayette and Vermilion Parishes, Louisiana, (Price et al. 1978; #22-418). The survey was conducted prior to the implementation of planned flood prevention, watershed protection, and drainage improvements. These improvements encompassed approximately 29 km (18 mi) of channel work in the Youngsville area. A literature search identified two sites, USL-RB 2121 and Coe-Historic; both sites fell within the Supplemental Area #3 boundaries; however, neither site would be impacted by the planned improvements. Fieldwork within the project corridor included pedestrian survey augmented by the excavation of an unspecified number of auger and shovel tests throughout the proposed project area. During survey, three small historic scatters (NLU-78-174 through NLU-78-176) dating from the late nineteenth and early twentieth centuries were recorded. These sites were assessed as not significant, and no additional testing of the three sites was recommended. None of these sites is located within 1.6 km (1 mi) of the currently proposed project corridor. The two previously recorded

sites were not assessed since they fell outside of the boundaries of the then-proposed impact area (Price et al. 1978).

Coastal Environments, Inc., conducted a Phase I cultural resources survey of Coulee Ile Des Cannes, Lafayette Parish from March 1 to March 4, 1986. This survey was undertaken on behalf of the Lafayette Parish Government in anticipation of a number of proposed drainage improvements. The project area originated at the confluence of Coulee Ile Des Cannes and Vermilion Rivers, and ended 28.48 km (17.7 mi) down the Coulee Ile Des Cannes, i.e., just south of Louisiana State Road 98. The right-of-way area measured 45.72 m (150 ft) in width, and extended along either bank of the Coulee Ile Des Cannes. Fieldwork included pedestrian survey and the excavation of an unspecified number of 50 cm (19.69 in) deep shovel tests. Shovel tests were placed in a number of high probability areas, i.e., at or on elevated areas, hillocks or ridges (Whelan 1986:13).

Three previously recorded sites were revisited as a result of this investigation: Sites 16LY1, 16LY7, and 16LY51. The first two sites, 16LY1 and 16LY7, had been altered significantly by residential construction and landscaping. No cultural material was recorded from either site. The third site, 16LY51, could not be relocated accurately due to ambiguities found on the previously submitted site form. During survey, one projectile point/knife was recovered, however, from the general site area. Due to flooding and the denial of access by some property owners along the Coulee Ile Des Cannes, only 90 percent of the project area was examined for cultural resources. No new cultural resources were identified, and the three sites were assessed as ineligible for nomination to the National Register of Historic Places. Because past dredging of the river had left thick spoil deposits along the banks, the possibility existed that several archeological sites may have been buried and therefore not identified. With this in mind, Whelan recommended that the Division of Archaeology in Baton Rouge be contacted before beginning the project in order to ascertain what discovery procedures would be followed in the event that a site was located.

Between October 31, 1990 and June 6, 1991, Dennis Jones and Malcolm Shuman of the Museum of Geoscience, Louisiana State University, performed a survey of all mound sites identified in Acadia, Lafayette, and St. Landry Parishes (Jones and Shuman 1991; #22-1681). This study was part of a larger National Park Service funded project designed to investigate all of the mound sites in Louisiana. The project was funded by the Department of the Interior, through the Department of Culture, Recreation and Tourism, Office of Cultural Development, Division of Archaeology, and by Federal funds designated for the identification and protection of historic properties. A total of 35 mound sites were visited; 13 of these were existing mound sites, the remaining 22 locations represented either destroyed or misreported sites.

Intensive mapping, pedestrian survey, archival research, and local interviews were conducted in order to record the condition of the sites, and to determine their cultural affiliation. No subsurface investigations were carried out at any of the sites. All of the mounds identified in Lafayette Parish (n=5) either were destroyed or their locations had been misreported. Research potential assessments were made for 30 of the sites; 7 were rated as good, 14 were scored fair, and 8 were assessed as poor. Of the five Lafayette Parish locations visited, four were characterized as poor, and the remaining site had only fair research potential. No National Register of Historic Places significance evaluations were made, nor were avoidance or mitigation recommendations made for the 35 sites investigated.

During September and October 1995, AR Consultants, Dallas, Texas, performed a Phase I cultural resources investigation of a proposed 10-inch propylene pipeline corridor that stretched from Sorrento, Louisiana to Mont Belvieu, Texas (Skinner et al. 1995; #22-1926). The planned pipeline right-of-way measured approximately 427 km (265 mi) in length; approximately 309 km (192 mi) of this corridor extended through Louisiana; the remaining 118 km (73.3 mi) of pipeline right-of-way was located in Texas. The 18 m (60 ft) wide right-of-way followed the previously surveyed Shell TLP pipeline corridor (McIntire 1978). In Louisiana, the pipeline corridor passed through portions of Ascension, Iberville, St. Martin, Lafayette, Vermilion, Acadia, Jefferson Davis, Calcasieu, and Cameron Parishes, before it crossed into Orange County, Texas. As part of this investigation, approximately 150 ac (61 ha) were surveyed in Louisiana, and another 95 ac (38 ha) were examined in Texas for evidence of

cultural resources. Survey of the LOUTEX Pipeline, as it was known, was conducted at the request of GLOBAL Environments, Inc., of Houston, Texas. Concha Chemical Pipeline Company, an affiliate of Shell Pipe Line Corporation, Houston, Texas, was the owner of the proposed LOUTEX Pipeline, and the pipeline was scheduled to be operated by Shell.

An archival search conducted in both Texas and Louisiana failed to identify any previously recorded sites directly within the area of potential effect. The TLP Pipeline had been rerouted early on to avoid those sites previously identified with the original pipeline corridor. During survey, 64.4 km (40 mi) were designated as high probability areas, 298 km (185 mi) were classified as having a low probability for containing cultural resources, while the remaining 64.4 km (40 mi) were considered to be of negligible probability (e.g., inundated areas such as swamps or marshes or previously disturbed areas). The survey focused on areas situated immediately adjacent to major drainages, on areas with high elevations located near the major drainages, and in areas surrounding perennial streams. Fieldwork consisted of pedestrian survey and, where necessary, vehicular survey. In the high probability zones, shovel tests were excavated at 30 or 100 m (98 or 328 ft) intervals, while shovel testing in the low probability zones was conducted at intervals greater than 100 m (328 ft).

As a result of this survey, two prehistoric shell middens (no site numbers were noted in the report) were recorded in St. Martin Parish along the Atchafalaya River; however, both of these middens were located outside of the planned project right-of-way. Neither midden site fell within 1.6 km (1 mi) of the current proposed project area. No significant cultural resources were identified during survey of the right-of-way corridor, and no additional testing of the proposed LOUTEX Pipeline was recommended. AR Consultants also recommended that an archeologist be on call, in the event that future construction activities disturbed any previously unrecorded cultural resources.

The Louisiana Department of Transportation and Development contracted Sellers & Associates, Inc., Lafayette, Louisiana, to conduct a Phase I cultural resources survey and archeological inventory of five alternate routes of Ambassador Caffery Parkway in Lafayette Parish, Louisiana (Gibson and Brasseaux 1997; #22-1927). This survey, performed in 1997, supplemented the investigations of three previously proposed alternate routes examined in 1995 and 1996 on the Ambassador Caffery Parkway extension. The five planned alternates, C, D, G, K, and L, encompassed approximately 67 ac (27 ha). Archival research failed to identify any previously recorded archeological sites in the survey area. Fieldwork consisted of pedestrian survey augmented by the excavation of an unspecified number of shovel tests. These shovel tests were excavated at 30 m (98 ft) intervals in areas assessed as having a high probability of containing cultural deposits and at 50 m (164 ft) intervals elsewhere throughout the project area. During survey, one historic site, 16LY81, was recorded; artifacts recovered from this site included whiteware/ironstone sherds, brick fragments, and glass; the material dated from ca. 1830 and 1970. Site 16LY81 was assessed as not significant and no additional testing of the site or of the five planned alternates was recommended. Site 16LY81 does not fall within 1.6 km (1 mi) of the currently proposed project area.

Previously Recorded Sites Located within 1.6 km (1 mi) of the Proposed Project Area

Only three previously recorded archeological sites (16LY23, 16VM124, and 16VM125) were identified within 1.6 km (1 mi) of the proposed project corridor. All three sites were recorded by Jon Gibson in 1975. These sites are described below.

Site 16LY23 is located in Section 40, of Township 11S, Range 4E, in Lafayette Parish, Louisiana; it is a prehistoric site of unknown function. The recovery of projectile points, lithic flakes, ground stone, and faunal remains from the surface of the site, indicate a Late Archaic or nascent Poverty Point Period cultural affiliation. On the Louisiana site form, Gibson described the associated cultural material as "exotic lithic materials hint of outside contact or trade." The site area, however, had been impacted by agricultural activities. The site size, significance, and recommendations for treatment were not provided on the submitted site form.

Site 16VM124, also known as the Beverly Picard Site and USL 16VM17, is described as a prehistoric lithic scatter of undetermined size. The site is located in Section 51, of Township 11S, Range 4E in Vermilion Parish, Louisiana. The

recovery of one Gary projectile point, one Pelican projectile point, and one unidentified dart point preform, suggests that the site dates from the Paleo-Indian Stage. Site 16VM124 was not assessed, nor are there any recommendations provided on the site form.

Gibson describes Site 16VM125 as a probable base camp or village that dates from ca. 1200 A.D., i.e., from the Plaquemine Period. The site contains a slightly stained earth midden with two possible house mounds or natural pimple mounds. Potsherds were recovered only from the surface of the site area. Other names assigned to Site 16VM125 include the Archie Picard Site and USL 16VM11. The site is located in Section 51, of Township 11S, Range 4E, in Vermilion Parish, Louisiana. Site 16VM125 was not assessed, nor are there any recommendations contained on the submitted site form.

CHAPTER VI

RESEARCH METHODS

This chapter describes the research design and field methods that were used to complete the current investigation. The chapter also includes a discussion of the laboratory methods and the procedures used to process and analyze the cultural material recovered as a result of this undertaking.

This Phase I cultural resources survey, assessment, and archeological inventory was designed to identify prehistoric and historic period cultural resources located within the areas of potential effect. Planning for both the marine and terrestrial surveys took into account the natural environment of the project area and the history and prehistory of the region. The terrestrial survey also included a review of the results of each previously completed archeological survey completed within the region as well as the distribution of all previously recorded archeological sites located within the immediate vicinity of the proposed project area. These data then were used to evaluate the potential of each project item to contain significant cultural resources.

Fieldwork consisted of underwater archeological survey of a small portion of the Vermilion River, and a combination of pedestrian survey, shovel testing, and magnetometer survey of the terrestrial areas where the proposed dredged material will be disposed in Lafayette Parish, Louisiana. The field methods utilized to complete this investigation are described below.

Marine Remote Sensing Investigations

Remote sensing investigations within the Vermilion River included a detailed examination of the riverbed for evidence of shipwrecks or other submerged cultural resources. This survey utilized a remote sensing assay that included a differential global positioning system (DGPS), a digital-output recording proton precession marine magnetometer, a fathometer, and a digital side scan sonar (Figure 16). A field notebook, in which information on the methodology and details of the survey were recorded, was maintained throughout the survey. This information included data on the dimensions of the survey vessel, the configuration of the remote sensing array, navigation antennae locations, cable lengths, sensor tow depths, instrument offsets and laybacks, instrument settings, noise to signal ratios, weather conditions and sea states, vessel speed and courses, numbers of transects surveyed, preliminary inventories of magnetic and acoustic anomalies, and other miscellaneous observations. Upon completion of the field survey, the digital data were post-processed and then correlated with the field notes for analysis and interpretation.

Logistics

Survey Planning

The marine portion of the remote sensing survey was conducted on April 15, 1998. Coordinates for the project area were collected using the Louisiana (South) State Plane Coordinate System, and they referenced the 1983 North American Datum (NAD-83). The location of the project area was obtained from an *Autocad* map supplied by the U.S. Army Corps of Engineers, New Orleans District. Using this map, the coordinates for the centerline were plotted using *Hy-*

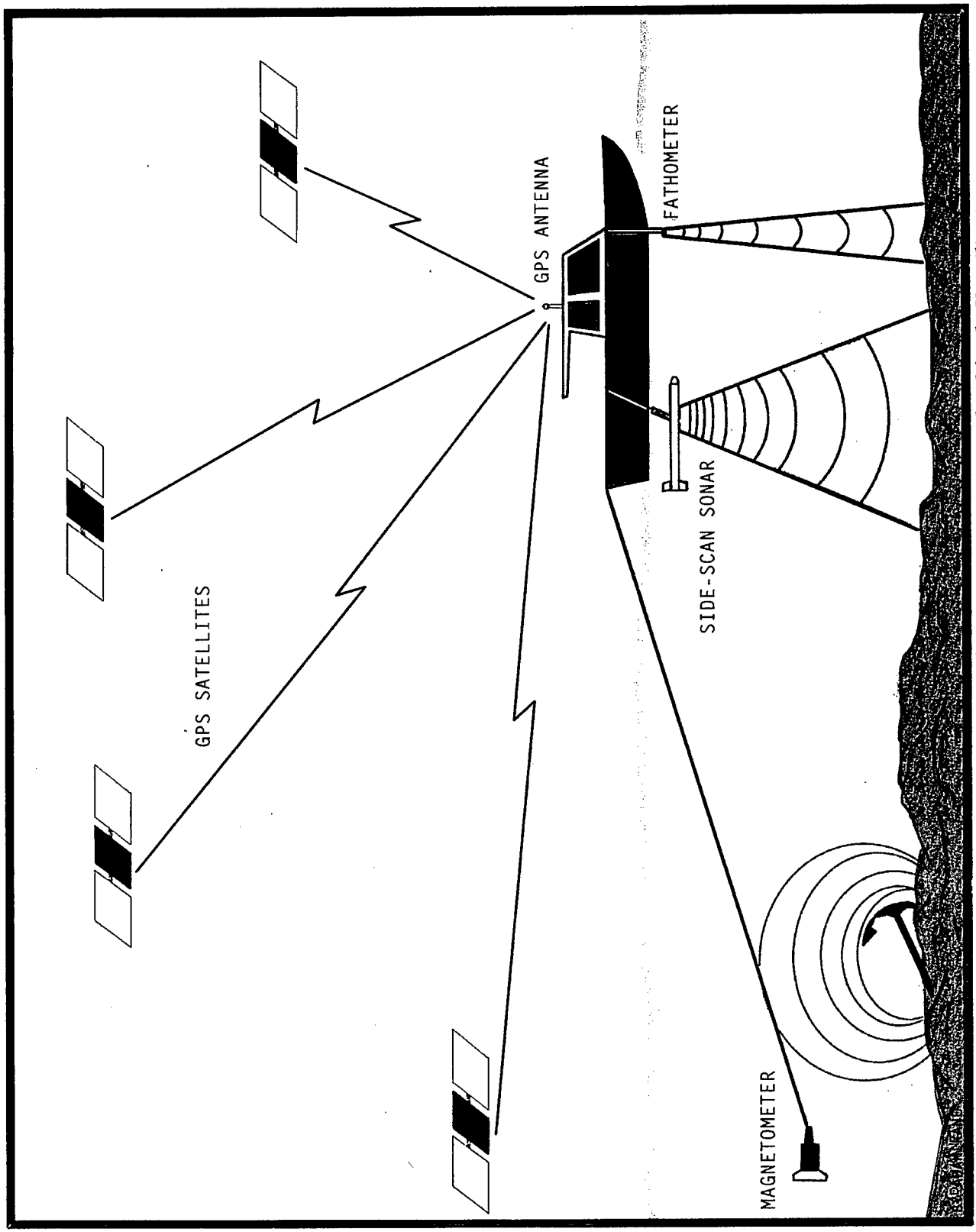


Figure 16. Drawing showing the array of remote sensing and positioning equipment utilized for the Vermilion River Survey.

pack's planned line function, and parallel track lines were produced that mimicked the curves of the Vermilion River project corridor. Bank-to-bank coverage of the project area was obtained by surveying three tracklines spaced 15.24 m (50 ft) apart.

Survey Vessel and Remote Sensing Instrument Configuration

This remote sensing investigation was conducted from the 6.71 m (22 ft) research vessel *Coli*, which was leased from the Louisiana Universities Marine Consortium (LUMCON); the vessel was captained by Mr. Sam LeBouef. *Coli* provided a stable platform from which to conduct the survey. The enclosed cabin of the vessel housed the navigational equipment, a laptop computer, the magnetometer recorder, sonar processor, fathometer display, and three persons, while the after deck provided ample work space for deploying the magnetometer and side scan sonar towfishes.

The DGPS beacon receiver and GPS antenna were mounted on the roof of the cabin, with the DGPS receiver offset 0.91 m (3 ft) starboard of the longitudinal centerline of the vessel. The GPS antenna, which received the satellite signals, was positioned 3.96 m (13 ft) forward of the stern, and 0.91 m (3 ft) to port of the vessel's longitudinal centerline of the *Coli*. With the aid of a boom, the side scan sonar sensor was deployed off the port side roughly amidship, 1.30 m (4.28 ft) aft of the GPS antenna. During survey, the elevation of the side scan sonar sensor was maintained at a constant level of 0.61 m (2 ft) below the surface. The magnetometer sensor was towed from the port stern quarter of the survey vessel, with a layback of 19.2 m (63 ft) from the GPS antenna, and at a constant depth below surface. The fathometer transducer was attached to a steel pipe mounted to the fantail of the *Coli* at a depth of 0.61 m (2 ft) below the water's surface. A vessel speed of 4.5 to 5.1 kmph (2.8 to 3.2 mph) was maintained during the survey.

Positioning

Precise positioning of detected anomalies was judged to be especially important since changes in the location of the proposed undertaking may be necessary to avoid adverse impacts to a particular feature, or for relocating targets when diver inspection is required during subsequent investigations. During this survey, a Differential Global Positioning System (DGPS) was used to provide real-time positioning for all navigation and position-fixing. Differential correction signals were received and they were processed using a Northstar 941-DX DGPS unit with an internal DGPS receiver. Corrected positions in WGS-84 geographic coordinates were transmitted in NMEA 0183 code to a computer-based navigation system; it consisted of an IBM Thinkpad Pentium computer running Coastal Oceanographic's *Hypack* (version 7.1) hydrographic survey software. *Hypack* performed instantaneous datum transformations from WGS-84 to NAD-83 state plane coordinates. During survey, *Hypack* provided displayed positions both numerically, via x/y coordinates and latitude/longitude, and by displaying the position of the vessel relative to the preprogrammed survey transects. This display provided a visual aid for the pilot during survey. *Hypack* also logged the corrected positions in ASCII format, as well as the time of the position fix. All data collected from the remote sensing instruments were logged and time and position fixes were appended to the data. After completion of the survey, the positioning files were utilized by *Hypack* in post-processing to produce track plot maps and to derive x/y positions for the logged data.

Coordinate Reporting

The coordinates of individual anomalies supplied in this text are reported in Louisiana (South) State Plane, and they reference the 1983 North American Datum (NAD-83) and they utilize the Lambert projection. The transformation of positioning data from the DGPS, supplied in WGS-84 format, to x/y State Plane coordinates required a conversion from an ellipsoidal to a planar coordinate system.

The State Plane Coordinate System of 1983 was necessitated by the 1983 adjustment of the North American Datum, a direct result of the accuracy that now is afforded by satellite positioning. For all practical purposes, NAD-83 and the global standard WGS-84 are identical and represent a vast improvement in accuracy over the old 1927 survey.

Magnetometry

The recording proton precession marine magnetometer is an electronic instrument that records the strength of the Earth's magnetic field in increments of nanoTeslas or gammas. Magnetometers have proven useful in marine research as detectors of anomalous distortions in the Earth's ambient magnetic field, particularly distortions that are caused by concentrations of naturally occurring and man-made ferrous materials. Distortions or changes as small as 0.5 gammas are detectable when operating the magnetometer at a sampling rate of one second. Magnetic distortions caused by shipwrecks may range in intensity from several gammas to several thousand gammas (Figure 17), depending upon factors such as the mass of ferrous materials present, the distance of the ferrous mass from the sensor, and the orientation of the mass relative to the sensor. The use of magnetometers in marine archeology and the theoretical aspects of the physical principles behind their operation are summarized and discussed in detail in Aitken (1961), Breiner (1973), Green (1990), Hall (1966, 1970), Tite (1972), and Weymouth (1986).

Ferrous deposits originating from natural and anthropogenic sources produce distinctive anomalous magnetic "signatures." For purposes of this discussion, these signatures are categorized as one of four types: 1) positive monopole; 2) negative monopole; 3) dipolar; and 4) multicomponent (Figure 18). Positive and negative anomalies refer to monopolar deflections in the ambient magnetic field. The polarity of the signature is dependent upon the orientation of the anomaly source relative to the magnetometer sensor, and whether its positive or negative pole is closest to the sensor. Dipolar signatures display both a rise and a fall above and below the ambient field, with the dipolar deflection usually aligned along the axis of the magnetic field and the negative peak of the anomaly falling nearest the North Pole. Multicomponent or complex signatures are characterized as areas of general disturbance consisting of both dipolar and monopolar anomalies spread out over a relatively large area.

Numerous attempts to characterize the types of magnetic disturbances made by shipwrecks (Clausen 1966; Clausen and Arnold 1975:169) have been unsuccessful, because, as Gordon Watts observed, "the remains of vessels can be demonstrated to generate every type of signature and virtually any combination of duration and intensity" (Watts 1986:14). Murphy and Saltus (1990:95) warned that "the quest for a 'signature' for any particular wooden shipwreck is time ill spent...", and point out that it is impossible to distinguish a genuine shipwreck site from one formed by ". . . cable, iron sewer pipe, and spikes." In fact, modern debris has been shown to generate virtually the same dipolar or multicomponent signatures as those produced by iron and steel hulled ships (Irion and Bond 1984; Irion 1986).

Some researchers feel, however, that progress has been made in developing an interpretive framework for analyzing magnetic data and for discriminating between modern debris and shipwrecks. In a major study conducted by Garrison et al. (1989) for the Minerals Management Service, two offshore lease blocks were surveyed with a transect interval of 164 ft (50 m). A three-dimensional contour map of the resulting anomalies was created, and the sources of the anomalies were inspected by divers. The objective of the study was to compile a sample inventory that would reflect a real population of shipwrecks or modern debris in the study area. The researchers concluded that the relationship of magnetic signatures and their spatial distribution is critical to determining patterns for shipwrecks and then discriminating these patterns from those of isolated modern ferromagnetic debris (Garrison et al. 1989:214). In essence, Garrison agrees with Arnold (1982) who stated that "the patterning of anomalies on adjoining survey tracks (spaced 50 m [164 ft] apart) is the key to identifying significant anomalies and distinguishing them from those far more numerous anomalies caused by isolated iron debris, which often show up only on one track."

Lane spacing becomes a key component when attempting to distinguish the signature of a shipwreck from those of the debris that litters the bottom of most waters, and dissenting opinions argue that Garrison et al. (1989) and Arnold (1982) utilized intervals that were too wide for reliable detection of wrecks. In other words, with a lane spacing as wide as 45.73 - 50 m (150 - 164 ft), even shipwrecks may show up as a single anomaly rather than as a cluster, or a small ferrous mass might not show up at all, particularly if it is located midway between two

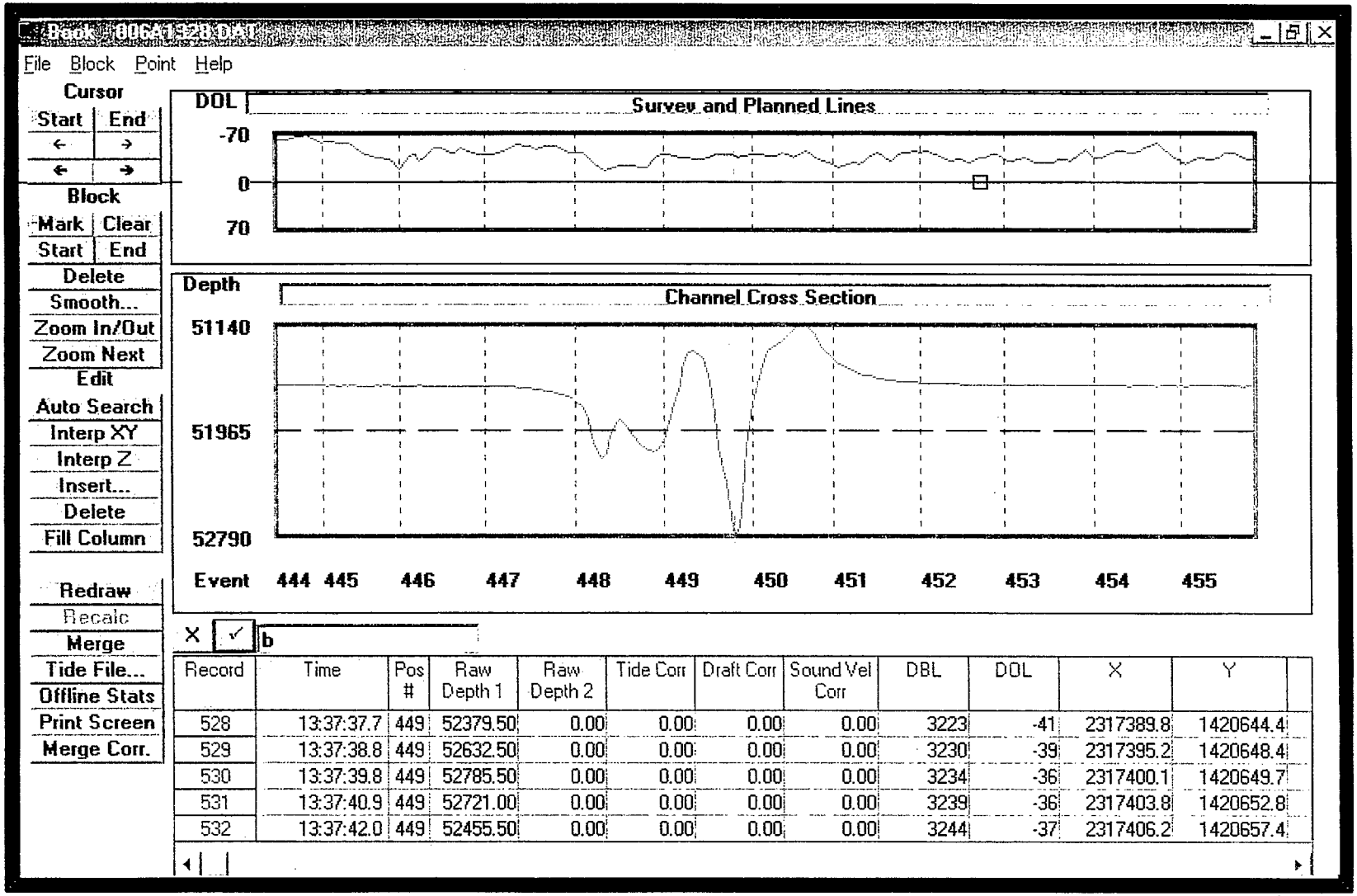


Figure 17. Hypack "Edit" screen image of a 1,650-gamma magnetic anomaly caused by the hull remains of a ca. 1860 steamboat wreck discovered by RCGA during a recently completed remote sensing survey of the upper Yazoo River, near Greenwood, Mississippi.

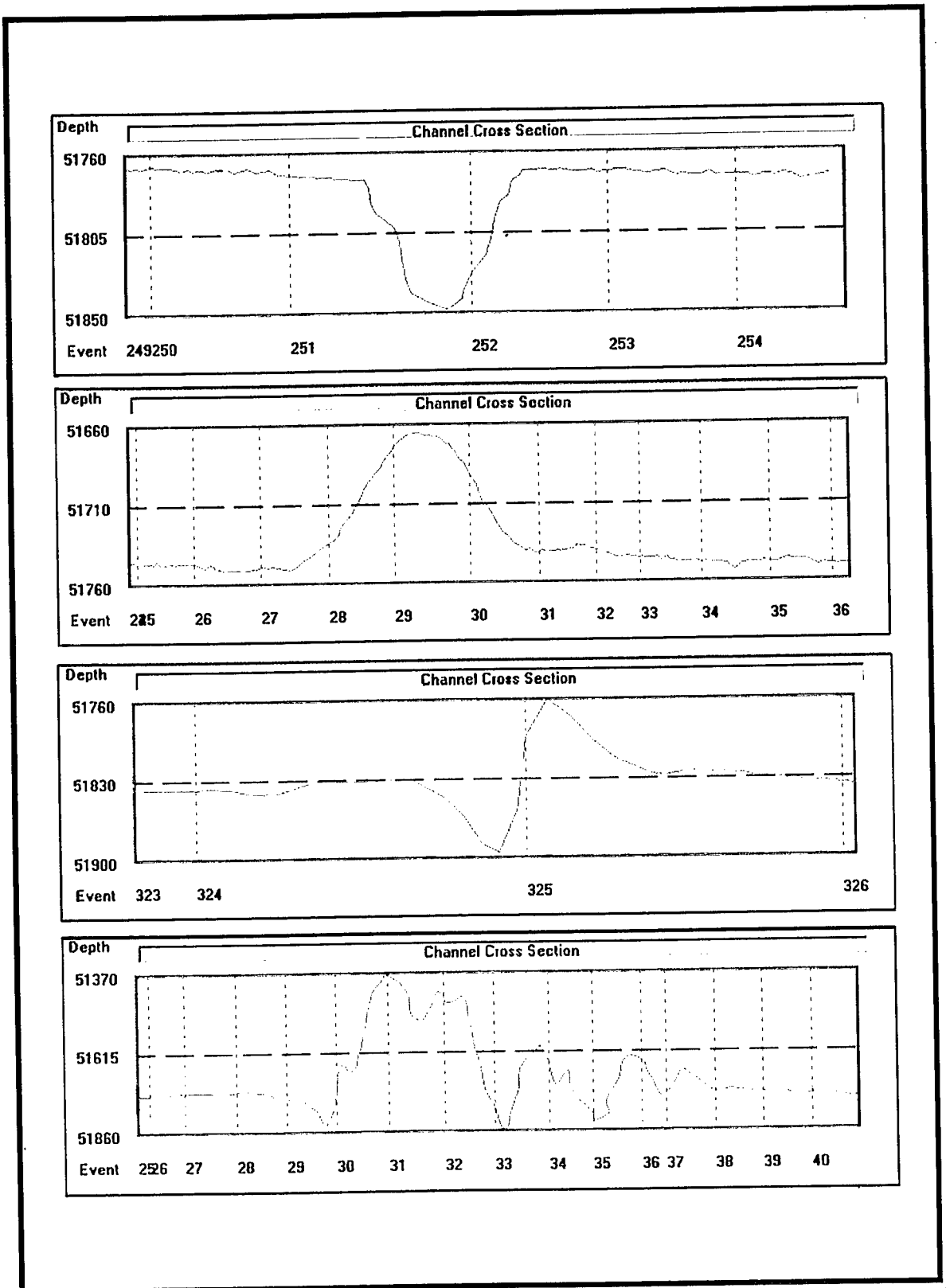


Figure 18. ***Hypack "Edit" screen images illustrating magnetic anomalies with positive monopolar, negative monopolar, dipolar, and multicomponent signatures. The positive and negative signatures appear inverted, because Hypack records the magnetic readings as "depths"; therefore, "higher" positive readings appear to trend downward rather than upward.***

widely-spaced survey lanes. The distance between the sensor and the anomaly source is critical, because the decrease in the intensity of an anomaly does not follow a straight arithmetic progression with increasing distance. Instead, intensity diminishes very rapidly as the inverse cube of the distance.

To appreciate more fully the effect that the distance between the sensor and the anomaly source has upon the amplitude of the magnetic deflection, a 450 kg (992 lb) ferrous mass, such as an anchor, provides a useful example. In a survey conducted at a 30 m (98.42 ft) lane spacing, such a target located directly between two lines (15 m [50 ft] from the sensor) would yield an anomaly of at least 10 gammas (Murphy 1993:379). If the discovery of this type of feature is an objective of a survey, all anomalies of 10 gammas or more would have to be examined carefully. In contrast, at a distance of 7.5 m (25 ft) from the sensor (as obtained in a survey with a 15 m [50 ft] lane spacing), such a target would likely yield an 80 gamma deflection. Thus, with a tighter survey interval, the threshold at which an anomaly becomes potentially significant is somewhat higher than is the case in a survey in which a wider spaced survey interval is employed.

Recognizing the importance of minimizing the distance between sensor and source, the Submerged Cultural Resources Unit (SCRU) of the National Park Service in 1990 began advocating a maximum lane spacing interval of 30 m (100 ft) to achieve a high degree of certainty for the recognition of historic shipwrecks from their magnetic components (Murphy and Saltus 1990:94). Their reasoning was that during a survey with tightly spaced track lines, it is more likely that the magnetometer will pass directly over a large debris field at least once and that its magnetic signature may be detected more easily over multiple lanes. In addition, magnetic sources with lower amplitude, but nonetheless significant, signatures also may be detected with narrower lane spacing. Even with a 30 m (100 ft) survey interval, however, additional survey work at tighter lane spacing is required to define individual anomalies clearly.

While attempting to identify conclusively the specific source of a particular magnetic signature without archeological groundtruthing may be impossible, data collected during several close interval (7.62 - 15.24 m [25 -50 ft]) surveys conducted recently by R. Christopher Goodwin & Associates, Inc., have demonstrated that magnetic signatures can be characteristic of some types of targets. For example, when the sensor is close to an isolated, small, ferrous object, the magnetic signature usually is a brief duration monopolar or dipolar deflection that occurs along a single survey transect. For larger, isolated ferrous objects, where the sensor is close to the source of the anomaly, the signature in most instances still will be monopolar or dipolar, but usually will be of longer duration and higher amplitude, and it will appear on more than one survey transect. In contrast, when the anomaly source consists of a large area of ferrous debris (e.g., the disarticulated hull of a ship and its cargo or modern refuse), and the sensor passes directly over the area of debris, the signature is likely to be multicomponent and to consist of both monopolar and dipolar deflections resulting from the magnetometer sensor detecting the presence of individual ferrous objects comprising the debris field as it passes over them. Furthermore, multicomponent anomalies caused by large amounts of scattered debris will appear on multiple tightly-spaced transects.

In the case of a relatively intact shipwreck accompanied by a debris field, when the sensor passes over the source, the signature typically is a high amplitude, long duration, monopolar or dipolar deflection that is "embedded" or "surrounded" by numerous, smaller, shorter duration monopolar and dipolar deflections. Significantly, this type of multicomponent signature changes markedly when the distance between the source and the sensor is increased. At a distance of 15.24 m (50 ft), the same anomaly source may no longer produce a multicomponent perturbation, but instead it may exhibit a large, but much lower amplitude and slightly shorter duration, single dipolar signature. When the distance from the source to the sensor is increased to 30.48 m (100 ft), the signature usually becomes a dramatically lower amplitude, significantly shorter duration, monopolar deflection. At a distance of 45.72 m (150 ft), magnetic evidence of the deflection source may be entirely absent, or so slight that it is obscured in low-level ambient magnetic noise.

As noted above, marine remote sensing surveys that are conducted with a transect

spacing in excess of 30.48 m (100 ft) now are considered by many to be unreliable. Because of the potential for encountering the remains of small vernacular watercraft during the remote sensing survey of the Vermilion River project area, a 15.24 m (50 ft) transect interval was employed to achieve as detailed coverage of the survey area as possible. With a tighter lane spacing such as 15.24 m (50 ft), a shipwreck may be expected to yield a significantly larger number of anomalies over a given area. In addition, anomaly amplitude for many ferrous masses may be expected to be higher, because the shallow water depth and close lane spacing ensures that the magnetometer sensor will pass closely to any ferrous mass located within the project area. Theoretically (assuming perfect survey lanes), no anomaly on the river bed in this survey corridor would be positioned farther than approximately 7.62 m (25 ft) (half of the 15.24 m [50 ft] separation between survey lanes) from the sensor. Consequently, all but the smallest ferrous mass would be detected on multiple transects.

Precise measurements of the Earth's magnetic field were obtained using a Geometrics G866 recording proton precession marine magnetometer. To achieve 0.5 gamma resolution, magnetic data were collected at a one second sampling rate. These data were output in NMEA 0183 code to one of four serial ports associated with the onboard navigation computer. The data were read by *Hypack* as z values, time-tagged, recorded with its precise real-time coordinates supplied by the DGPS (x/y coordinates), and logged into the computer. The magnetometer sensor was towed at a distance measuring approximately 1.5 times the length of the survey vessel to eliminate any electromagnetic noise that may be associated with the operation of the boat. Offset and layback distances between the magnetometer sensor and the GPS antenna were entered into *Hypack,* and positions for each magnetic reading were corrected accordingly. Records for the survey were produced in digital format, and potentially significant anomalies and sources of spurious magnetic noise (i.e., bulkheads, refuse dumps, overhead powerlines, and iron outflows, etc.) were recorded in the field log as they were encountered and observed during the course of the survey.

Acoustic Imaging

Over the course of the past 25 years, the combined use of magnetic and acoustic (sonar) remote sensing equipment has proven to be the most effective method of identifying submerged cultural resources and assessing their research potential (Green 1990; Hall 1970). When combined with magnetic data, the near photograph-quality sonogram records produced by state-of-the-art side scan sonar systems have left little doubt regarding the identifications of some intact shipwrecks (Figure 19).

An Imagenex color imaging digital side scan sonar system was utilized during the Vermilion River survey to produce sonograms of the river bottom within the project area. The Imagenex system consisted of a Model 858 processor coupled with a Model 855 dual transducer operating at a frequency of 330 kHz. The sonar was set at a range of 27.43 m (90 ft) per channel, which yielded an overlapping coverage of the study area. Sonar data were recorded on a 270 megabyte 8.9 cm (3.5 in) Syquest cartridge drive, and a stream of time-tags was attached continuously to the sonar data, to assist in post-processing the correlation of the acoustic and magnetic data sets. Acoustic images were displayed on a VGA monitor as they were recorded, and an observation log was maintained by the sonar technician to record descriptions of any acoustic anomalies, as well as the time and location they were detected. Anomalous acoustic targets were inventoried both during the survey and in post-processing.

Bathymetry

A Cetrek C-net Model 930-370 digital fathometer was used to record bathymetric data along each survey transect. Depths from the fathometer and real time locational data from the DGPS were transmitted in NMEA 0183 code to *Hypack* and recorded. *Hypack* also calculated transducer layback and offset values, and made corrections to the bathymetric data. Bathymetric data was collected to assist in the identification and evaluation of magnetic and side scan sonar targets.

Survey Control and Correlation of Data Sets

The *Hypack* survey software provided the primary method of control during the survey.

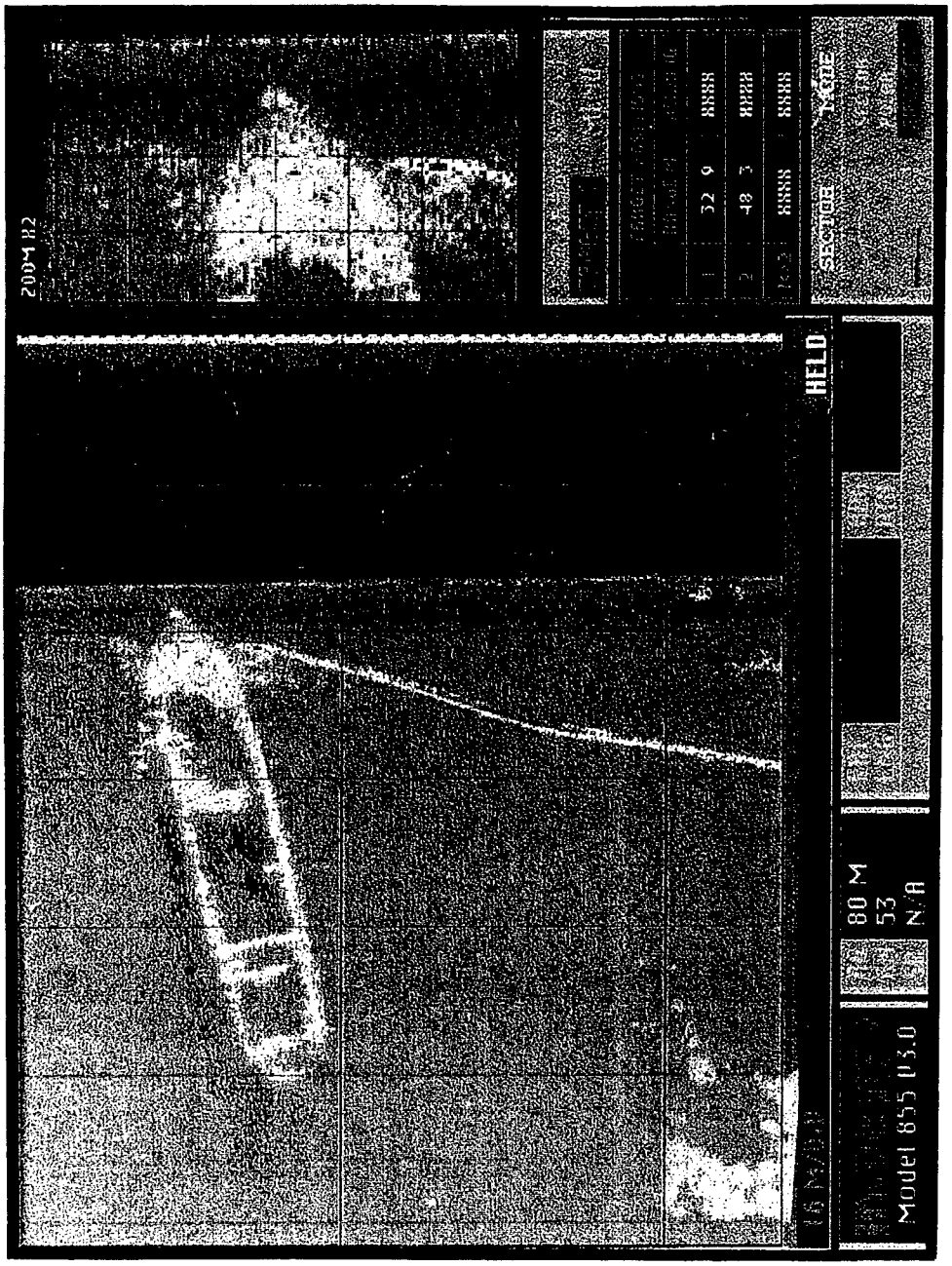


Figure 19. Imagenex 858 side scan sonar image of a submerged boat (courtesy of Imagenex, Inc.).

Survey lanes were planned, geodetic parameters were established, and instruments were interfaced and recorded utilizing this software. During survey, the course of the vessel relative to the planned survey line was monitored. In addition to providing steering direction for the helmsman, *Hypack* allowed the surveyors to monitor instruments and incoming data through additional windows on the monitor screen; the survey screen displays a navigation chart with pre-planned tracklines, and the windows utilized for data monitoring (Figure 20). All remote sensing data were correlated with DGPS positioning data and time through *Hypack*. Positions for all data then were corrected through the software for instrument layback and offsets.

The methodology employed during the survey produced favorable results, with reliable DGPS signals and clear acoustic images. All positioning and remote sensing equipment performed reliably throughout the survey, thus ensuring regular and evenly spaced coverage of the survey area.

Remote Sensing Data Analysis

Magnetic and acoustic data were analyzed while they were generated, and the data were post-processed using *Hypack* and Autodesk's *Autocad* (Version 12) software applications. These programs were used to assess the signature, intensity, and duration of individual magnetic disturbances and to plot the tracklines of the survey vessel. Sonograms were analyzed visually and then correlated with the magnetic data using time and positioning data to determine the presence of any spatial relationships or congruence between the detected anomalies.

Terrestrial Survey

Phase I cultural resources survey and archeological inventory of the proposed 35 ac (14.2 ha) dredged material disposal site in Lafayette Parish, Louisiana, consisted of pedestrian survey and systematic shovel testing. Transect survey at 30 m (98.4 ft) intervals within the 183 x 793 m (600 x 2,600 ft) project area was utilized to assure complete and thorough coverage, and to control the delineation and recordation of archeological sites/features encountered or exposed during survey. A total of six survey transects were positioned within the proposed dredged material disposal area. Each transect originated along the eastern boundary of the project area and extended in a westerly direction to the Vermilion River. Shovel tests were excavated at 30 m (98.4 ft) intervals along survey transects spaced 30 m (98.4 ft) apart.

Each shovel test measured approximately 50 cm (19.7 in) in diameter, and each was excavated to a minimum depth of 50 cmbs (20 inbs). Shovel tests were not excavated to a depth of 1 m (39 in) because the Prairie complex surface present throughout the proposed dredged material disposal site is buried only by a thin veneer of Holocene natural levee deposits (see Chapter II). Therefore, no deeply buried cultural deposits are likely to be located in the project area. All shovel test fill was screened though 0.64 cm (0.25 in) hardware cloth. Each shovel test was excavated in 20 cm (8 in) artificial levels within natural strata, and the fill from each level was screened separately. Munsell Soil Color Charts were used to record soil color; soil texture and other identifiable characteristics also were recorded using standard soils nomenclature. All shovel tests were backfilled immediately upon completion of the archeological recordation process.

Delineation

Cultural resources recorded during survey were examined to ascertain the nature, size, depth, integrity, age, and the cultural affiliation of the identified deposits. Delineation also was used to assess the stratigraphic placement, density, and research potential of each cultural resource. In addition, information was gathered to assist in the subsequent assessment of whether or not a site was significant, potentially significant, or not significant, applying the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]).

Archeological recordation included a combination of the following: (1) establishment of a site datum; (2) intensive surface reconnaissance of the area; (3) the excavation of tightly spaced shovel tests along rays emanating from datum to delineate both site size and configuration; (4) the excavation of auger tests to check for deeply buried cultural deposits; and (5) mapping and photographing the site area.

Magnetometer Survey

The terrestrial portion of the magnetometer survey was conducted using a Geometrics G-856

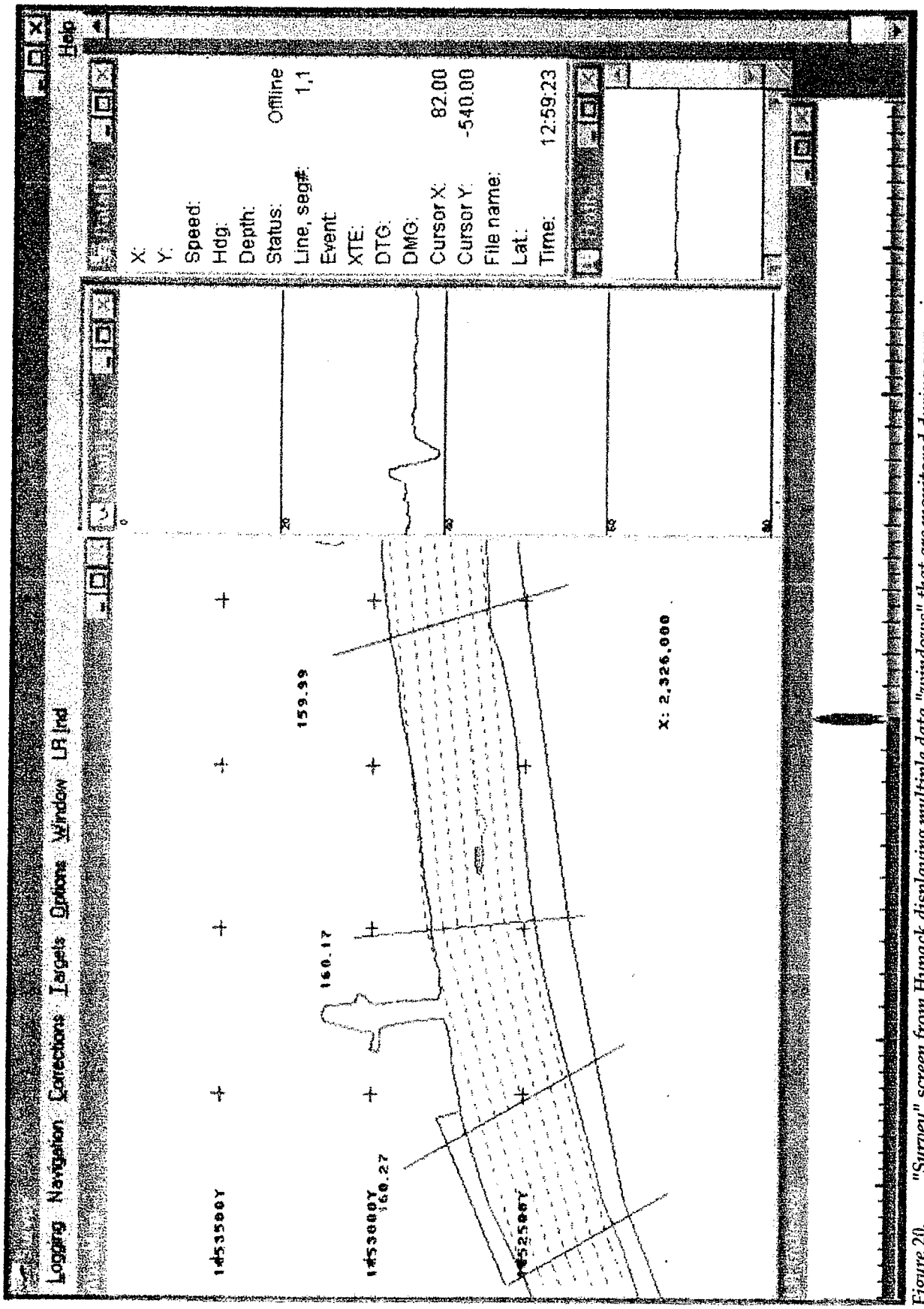


Figure 20. "Survey" screen from Hypack displaying multiple data "windows" that are monitored during surveying.

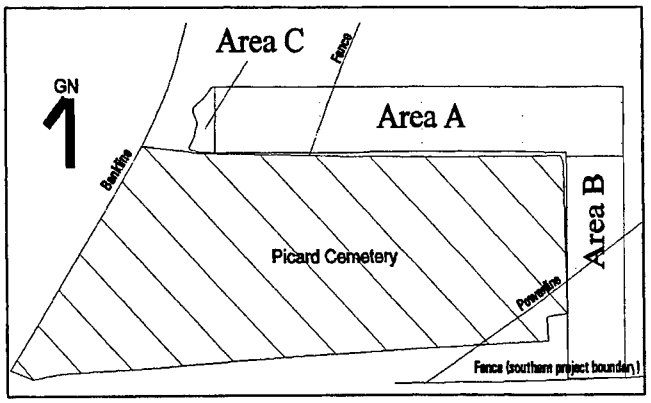


Figure 21. Magnetometer survey areas.

proton precession magnetometer. A 15 m (49.2 ft) buffer zone surrounding Picard Cemetery was surveyed to identify any possible unmarked graves located outside the known cemetery area. The buffer zone was partitioned into three separate areas to facilitate fieldwork (Figure 21). Areas A and C were surveyed with alternating east-west transects working from north to south, and Area B was surveyed with alternating north-south transects working from east to west. Area C was created to accommodate the irregular bluffline of the Vermilion River, i.e., the western end of the project area. A narrow strip of old unimproved road positioned directly south of Picard Cemetery and within the southern limit of the project area boundary was not surveyed, due to erratic magnetometer readings caused by nearby chainlink and barbed wire fences.

A grid was created for each of these three areas using a Topcon GTS-303 Electronic Distance Measurer. The survey area was gridded in a two step process incorporating a primary grid set out with the EDM from which guidelines were placed. The primary survey grid consisted of a series of wooden stakes that were placed at 25 m (82 ft) intervals along the long axis and 3 m (10 ft) intervals along the short axis of each of the project areas mentioned above. Guidlines then were attached to the stakes along the long axis. Transects then were sampled at a 1 m (3.3 ft) interval, and separated by a 1.5 m (4.9 ft) interval by walking along and between the guidelines on the long axis of each area. Multiple baseline readings then were taken for each survey area prior to undertaking survey within each area. All signal strengths measured between 4.0 and 4.2 (arbitrary units from 0.0 to 9.9, where 3.2 is a minimum valid signal), using a tuning value of 52,000 gammas. Initial gamma values all fell within a ± 0.2 gamma range. Once collected, all data were downloaded from the G-856 to an IBM-PC using Magloc software. Grid coordinates were assigned to each reading, and all areas then were combined to form a single Surfer .GRD file and contoured.

Auger Testing

Following the analysis of data generated during the magnetometer survey, selected areas within the 15 m (49 ft) Picard Cemetery buffer zone were subjected to probing, auger testing, and shovel testing. A thin steel probe was inserted into the small rises and depressions positioned within the buffer zone to determine if cultural features and/or artifacts were present. The probe was used in conjunction with the auger tests to assess those anomalies that may represent a cultural feature, an artifact, or the remains of an unmarked grave. All auger tests were excavated with an 8.26 cm (3.25 in) outer diameter bucket auger. Each auger test extended to a minimum depth of 160 cm (63 in) below ground surface. All soil from these tests was screened through 0.64 cm (0.25 in) hardware cloth. Each auger test was excavated by natural strata, and the fill from each stratum was screened separately. Munsell Soil Color Charts were used to record soil color; soil texture and other identifiable characteristics also were recorded using standard soils nomenclature. All auger tests were backfilled immediately upon completion of the archeological recordation process.

Architectural Review and Standing Structures Recordation

As a part of this Phase I cultural resources assessment, field crews were instructed to record all standing structures identified during survey. Since the proposed dredged material disposal has the potential to disturb or destroy historic properties, the purpose of this architectural recordation was to: (1) determine if any structures older than 50 years in age were present in or near the proposed project area; (2) collect reconnaissance-level architectural survey data for each historic building located within the area of potential effect; (3) apply the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d])

to each identified historic building; and, (4) apply the Advisory Council on Historic Preservation's Criteria of Effect to each identified historic property to anticipate the potential effects of the proposed undertaking on each identified property.

Architectural investigations were undertaken in accordance with guidelines established in *National Register Bulletin 24: Guidelines for Local Surveys: A Basis for Preservation Planning* (National Park Service 1995). The identification of standing structures older than 50 years in age was based on style definitions provided by McAlester (1990).

Laboratory Methods

Field specimen bag proveniences were cross-checked against the field notes and the specimen inventories for accuracy and completeness. Following this quality-control process, recovered materials were washed by hand, air-dried, and sorted into basic material categories.

Historic/Modern Materials

The analysis of the historic materials was organized by class, functional group, type, and subtype. The first level, class, represented the material category (e.g., ceramic, glass, or metal). The second level, functional group (e.g., architecture, kitchen, or personal), was based on classifications established by South (1977). The third and fourth levels, type and subtype, described diagnostic attributes.

Historic ceramic, glass, and brick artifacts are some of the more commonly marked, embossed, and branded commodities. Manufacturers/brands, i.e., "maker's marks," were used where possible to refine date ranges on these types of artifacts, which often have long spans of use popularity, or which exhibit little morphological or stylistic change over time. The identification of artifacts and maker's marks was aided by consulting standard reference works, including Coates and Thomas (1990), Fike (1987), Florence (1990), Jones and Sullivan (1985), Kovel and Kovel (1986), Lord (1995), Miller (1980, 1991), Nelson (1968), Schornak (1964), South (1977), Speer (1979), Switzer (1974), Toulouse (1971, 1977) and Wilson (1981).

Glass Artifacts

The classification of glass artifacts involves the recognition of diagnostic attributes representative of technological changes. The diversity of these techniques, however, necessitates a different approach to glass classification, one that incorporates combinations of distinct technological characteristics in order to arrive at chronological placement.

By the nineteenth century, advances in glass-making technology produced a series of improvements that had two significant implications for the archeological record: the temporal information provided by the succession of technological advances in glass manufacture enabled the development of a tight chronology for this time period, and the frequency of glass entering the archeological context increased as a direct result of those advances. With the advent of the Industrial Revolution (ca. 1850), improvements were made in mold, finish, and empontilling techniques, and in the development of a stable decolorizing agent for bottle glass. Documentation of these advancements produced a tight chronology of nineteenth through early twentieth century bottle glass types.

Technological improvements were not restricted to bottle glass manufacture during the nineteenth and early twentieth centuries. Press-molded tableware (pattern glass) underwent a series of manufacturing innovations that revolutionized the use of glass. The manufacturing improvements in press-molded wares also were applied in other areas of the glass industry, including personal and industrial applications. Furniture items, such as door and cabinet knobs, could be mass produced at reduced costs. The insulating qualities of glass also made it the most obvious choice for the telegraph, telephone, and electrical industry (Schroeder 1971).

Resources utilized for the analysis of non-bottle glass items included Florence (1985, 1990), Jones and Sullivan (1989), Lee (1931), McCain (1982), Peterson (1985), Schroeder (1971), and Welker and Welker (1985). The analysis of window glass was restricted to identification only. Pane shape can be diagnostic of age, and thus was noted when determined, but color and thickness varied to such a degree over time that

little can be gained from further analysis (Jones and Sullivan 1989).

Historic Ceramics

Ceramic analysis entailed a detailed descriptive and functional examination of each recovered ceramic sherd. All ceramic sherds recovered from the field testing were analyzed using a variety of methods. Ivor Noël Hume (1970) developed a concise taxonomy of seventeenth and eighteenth century English and northern European ceramic types, which has been refined in subsequent reports by a number of different authors. However, nineteenth century ceramics are characterized by very gradual refinements of paste and glaze, and therefore are more difficult to classify. Miller (1980) suggested that classification of nineteenth century ceramics should be based primarily on decorative type and form. This method, however, obscures variability in paste and other important chronological information. The basic classificatory typology utilized during this analysis combined elements previously suggested by Miller (1980 and 1991) and Worthy (1982). These methods were based primarily on paste color and type, and secondarily on glaze, decoration, and form. Recorded attributes included paste, glaze, decorative technique, and pattern. Transfer printed and hand-painted patterns, and maker's marks were described and identified when possible, using a variety of sources, including Coysh and Henrywood (1982), Cushion (1976), and Kovel and Kovel (1986). Vessel form and function also were noted where possible. The following discussion summarizes the ware types, and the diagnostic attributes noted during the analysis of the recovered ceramics.

Creamware, Pearlware, and Whiteware. These three ceramic types are closely related, and differ only in a gradual refinement of paste and glaze over a period that extended for approximately 100 years. Creamware, first introduced in the early 1760s, dominated the Staffordshire ceramic market during the second half of the eighteenth century (Miller 1991:1). It was characterized by a slightly yellowish tint, yellow-green pooling of glaze around footrings and in crevices, and by a porous cream to buff colored paste.

Pearlware developed as an improvement to creamware during the 1780s (Miller 1980:2), and gradually replaced creamware in popularity. While pearlware paste was only slightly lighter than that of creamware, it was whitened further by the addition of cobalt oxide to the paste (Majewski and O'Brien 1987:118). Cobalt also was added to the lead glaze as a whitener. This resulted in the diagnostic blue tint and blue pooling found around the footrings and in the crevices of pearlware vessels.

There are no specific dates for the development of whiteware, though it generally is agreed that a recognizable form appeared during the 1820s (Miller 1980:2; Yakubik et al. 1994:2). Whiteware represents a gradual evolution from pearlware, and it is characterized by many transitional variations. Cobalt oxide was used to whiten the paste in early varieties; however, for most of the nineteenth century, a nearly white body with a clear lead glaze dominated the ceramic tableware market. A clear alkaline glaze also was used on whiteware bodies, though less frequently than the lead glaze. Almost never used on decorated ceramics, alkaline glazes have a slightly greenish tint that is visible in the crazing of the glaze and in crevices where the glaze is thicker (Majewski and O'Brien 1987).

While creamware, pearlware, and whiteware all were decorated, a greater variety of techniques were employed on pearlware and whiteware. Annular banding, finger painting, and dendritic patterns (mocha) also were employed on yellowwares; they are discussed later in this section.

On pearlwares and whitewares, both blue and polychrome hand painting was common. Beginning ca. 1820, floral motifs were especially favored. Hand painted floral motifs continued in use through the last quarter of the nineteenth century, although popularity dipped in mid-century and revived again in the 1870s (Miller 1991:8). Introduced circa 1840, flow blue and flow purple were used both for hand painted and transfer printed designs. The addition of ammonium chloride to the kiln during the final firing caused the pigment to spread into the glaze, and created a blurred image with concentrations of color around the original decoration. Hand painted flow blue designs usually consisted of floral motifs.

Transfer printing was common on creamwares, pearlwares, and whitewares. Underglaze blue transfer printing was introduced on Staffordshire ceramics circa 1783, and quickly gained

popularity. The earliest patterns consisted of oriental scenes, followed during the second decade of the nineteenth century by landscapes and American scenes, and by romantic scenes in the 1830s. Color also serves as a chronological indicator. For example, blue printing was popular throughout the nineteenth century, but dark blue prints enjoyed popularity in the 1820s, while purple, brown, black, green and red were in use during the 1830s and 1840s (Miller 1991:8). By the middle of the nineteenth century, transfer printing lost popularity, although it continued to be produced throughout the century.

Annular decoration frequently was combined with other decorative techniques on a single vessel. Finger painting or marbling commonly was associated with annular bands. These wares had trails of polychrome slips (usually white, blue, and brown or black) applied to the vessel by hand. A variation of this was combed decoration, in which a comb-like tool was used to drag the slip. Similar in appearance to combed decoration were vessels that had multiple thin trails of white slip laid in geometric patterns. Finally, a common method of decoration employed the application of a mixture of tobacco juice and urine to a vessel prior to firing; this produced the distinctive dendritic pattern referred to as "mocha". All of these techniques usually were combined with annular bands bordering the field of decoration. Annular pearlware and whiteware were referred to in potters' price lists variously as "dipped," "colored," "mocha," and "banded" wares; they were popular until ca. 1840 (Miller 1991:6), although they were produced throughout the nineteenth century. Annularwares were produced in hollow forms only, such as mugs, bowls, and chamber pots.

The application of decoration with a cut sponge began in the 1840s, and continued throughout the nineteenth century. Sponge decoration often was combined with hand painting, and frequently was geometric in design. Spattered patterns achieved through the application of colored powders have been in use since the seventeenth century. Polychrome decal and monochrome stencil (usually gilt) were applied over the glaze, in a manner similar to enameled designs.

Yellowware. Yellowware, an American product, is considered to be a variety of earthenware, although it was made with stoneware clays; the firing temperature for yellowware vessels was not high enough to cause vitrification of the paste. Yellowware paste was slightly coarse and porous, usually characterized by a buff to brownish yellow color after firing. This usually was covered with a clear lead glaze that enhanced the yellow color of the paste. Yellowwares were manufactured between ca. 1830 and 1900 (Hahn et al. 1994:79) and typical forms included bowls, jugs, and other utilitarian hollowware.

The most common enhancements for yellowware were annular banding and mocha decoration. Rockinghamware was a variant of yellowware, characterized by its distinctive mottled brown surface, which was created by mixing manganese and iron oxides into the glaze (Goodwin et al. 1984:39; Yakubik et al. 1994:4). Rockinghamware was used for tableware and other decorative pieces.

Ironstone. Ironstone, manufactured in England from the early nineteenth century, began as a substitute for porcelain (Miller 1991:9-10), and by the 1840s, it had achieved popularity in America (Majewski and O'Brien 1987:121). This semi-vitreous ceramic was characterized by a thick, heavy body, and a by relatively fine-grained, non-porous texture. A clear to opaque glaze was applied to the vessels, and this contributed to its typical bluish-gray tint. While some of the earlier ironstone sherds were quite thick, later vessels were much thinner.

Early ironstone vessels frequently were decorated with hand painting or transfer printing, usually with Chinese motifs (Miller 1991:10). However, by mid-century, ironstone decoration was limited primarily to the simple molded form of the vessel.

Porcelain. Porcelain first was manufactured by the Chinese during the eighth century, but it was not until the fifteenth century that exportation to Britain began (Goodwin et al. 1984:40). During the eighteenth century, European efforts to pro-duce a similar hardpaste porcelain resulted in the development of a variety of soft-paste porcelains (Majewski and O'Brien 1987:126). By the early nineteenth century, this market was dominated by Spode's bone china, first developed in 1794. Despite their availability

in England throughout the nineteenth century, the majority of English porcelains on American archeological sites can be dated from the last half of the nineteenth century (Miller 1991:11).

Porcelain was characterized by a completely vitrified, translucent paste. Hardpaste porcelains had a clear, glassy glaze that rarely crazed. This feldspathic glaze was highly fused to the paste, exhibiting no clear line of separation. Hardpaste porcelain bodies were nonporous, with glass-like breakage patterns.

Soft paste porcelains, especially bone china, were fired at lower temperatures than hardpaste porcelains, which did not allow the glaze to fuse completely to the paste. Lower firing temperatures tended to leave a slight seam between the paste and the glaze. While the paste was fine-grained, the body did not break as cleanly as that of hardpaste porcelain.

Most of the decoration used on porcelains was overglaze decal, gilding, or embossing. Generally, the only underglaze decoration utilized was cobalt painting or printing, because it could retain its characteristics under the extreme heat of the glaze firing (Majewski and O'Brien 1987:128).

Tin-glazed Earthenwares. Tin-glazed earthenware vessels often are labeled as "delft" (English and Dutch), "majolica" (Spanish and Italian), and "faience" (French), depending on the presumed country of manufacture.

Tin-glazed earthenwares were characterized by a relatively coarse, buff to light brown or pink, porous, and friable paste. The tin-oxide glaze was thick and opaque, with a tendency to separate cleanly from the body of the vessel. The vessels were glazed on both the interior and exterior, but it was characteristic for the footring to remain unglazed. The glaze often was colored by the addition of various metal oxides, including cobalt, copper, and manganese. Typical vessel forms ranged from small jars or ointment pots to plates. The jars were characterized by short cylindrical bodies, everted lips, and by shallow concave interiors; they have been referred to elsewhere as ointment jars (Goodwin et al. 1984:35), rouge pots (Hahn et al. 1994:79), or cosmetic jars (Noël Hume 1969:204). The exterior of these vessels often was tinted, while the interior remained white.

Stoneware. Stonewares are characterized by a vitrified paste with a smooth, stony texture. Colors of stoneware bodies range from gray to brown, depending on the kind and amount of impurities in the clay. The brown stonewares ranged in color from a light buff to dark brown. Stonewares first were produced in the United States ca. 1775 and became popular by the beginning of the nineteenth century (Goodwin et al. 1984:39). Stonewares were most commonly wheel-thrown utilitarian vessels that ranged in form from crocks to jars, jugs, and bottles.

Surface treatments included lead or alkaline and salt glazes. A salt glaze was created by adding salt to the kiln as the vessel was being fired; the vaporized salt adhered to the exterior of the body, giving it its characteristic orange peel texture. Frequently, the interior of the vessel was glazed with a thick, dark matte brown Albany slip. The exteriors of some stoneware vessels were embellished with blue, hand-painted decoration.

Stoneware also was used for ale bottles; these were distinctive in paste and exterior treatment. The body was buff-colored, with a yellow glaze that extended from the lip to the shoulder of the vessel. In form, the bottles had conical necks and a variety of finished lips.

Prehistoric Lithic Analysis

Only one prehistoric lithic artifact was recovered during field testing at the proposed dredged material disposal site. This artifact was classified according to material type. The artifact function was inferred based on morphological characteristics. These taxonomic levels followed classifications presented by Callahan (1979), Crabtree (1972), and Servello (1983).

Curation

Following the completion and acceptance of the final report, all archeological materials, records, photographs, and field notes will be curated with:

State of Louisiana
Department of Culture, Recreation and Tourism
Office of Cultural Development
Division of Archaeology
1051 North 3rd Street, Room 405
Baton Rouge, LA 70804

CHAPTER VII

RESULTS OF THE FIELD INVESTIGATIONS

Introduction

The results of each phase of the field investigation are presented below. The results of the underwater survey of the proposed Vermilion River dredge area are presented first, and this is followed by the results of the terrestrial survey of the proposed dredged material disposal area.

Underwater Survey Results

The marine remote sensing survey produced 21 magnetic anomalies (Table 3), 10 acoustic anomalies (Table 4), and no evidence of bathymetric anomalies. The U.S. Army Corps of Engineers - New Orleans District map depicting the survey area was utilized throughout this investigation; for example, the tracklines of the survey vessel were overlaid onto the basemap to depict coverage throughout the project area (Figure 22).

Project Area Description

The project area extended between River Miles 47.5 and 48.4 of the Vermilion River in Lafayette Parish, Louisiana. Approximately 4.4 linear km (2.7 linear mi) of river bottom were surveyed for cultural resources. Water depths in the project area ranged from 0.91 to 3.05 m (3 to 10 ft). Land use in the project area consists primarily of suburban development, and potential sources of magnetic disturbance were noted throughout the project area. Numerous houses front the river and most residents have attempted to stabilize the river bank using iron, wooden, or fiberglass bulkheads or they have lined the river bank with a layer of sandbags filled with cement. Many of the landowners have constructed small docks or drainage culverts, or have placed architectural debris along the riverbank.

Magnetic Data

Nearly all of the project area contained significant levels of magnetic disturbance caused by modern human activities. During survey, a number of modern disturbances were noted. Bulkheads, which line the majority of the project area, caused high amplitude magnetic disturbances of considerable duration (Figures 23 and 24). Iron bulkheads caused disruptions in the ambient magnetic field and they ranged from 537.0 to 10,203.0 gammas in amplitude. Composite bulkheads of wood and iron construction, however, created magnetic perturbations of only 76.0 to 2,323.0 gammas. Architectural debris including concrete with re/bar, bricks, and metal debris was observed along the riverbank in numerous locations (Figure 25); magnetic disturbances associated with this debris ranged from 96.0 to 1926.5 gammas. Other more localized disturbances included overhead power lines (416.0 to 36,098.0 gammas) and a boat launch (424.0 to 39,206.5 gammas).

Finally, two of the magnetic anomalies recorded during survey could not be attributed to readily visible modern features. Magnetic anomalies 3 and 5 were classified as high amplitude (440.5 and 526.5 gammas) multicomponent and dipolar disturbances of short duration (8 and 6 seconds, respectively). The short duration of these anomalies suggests that they are

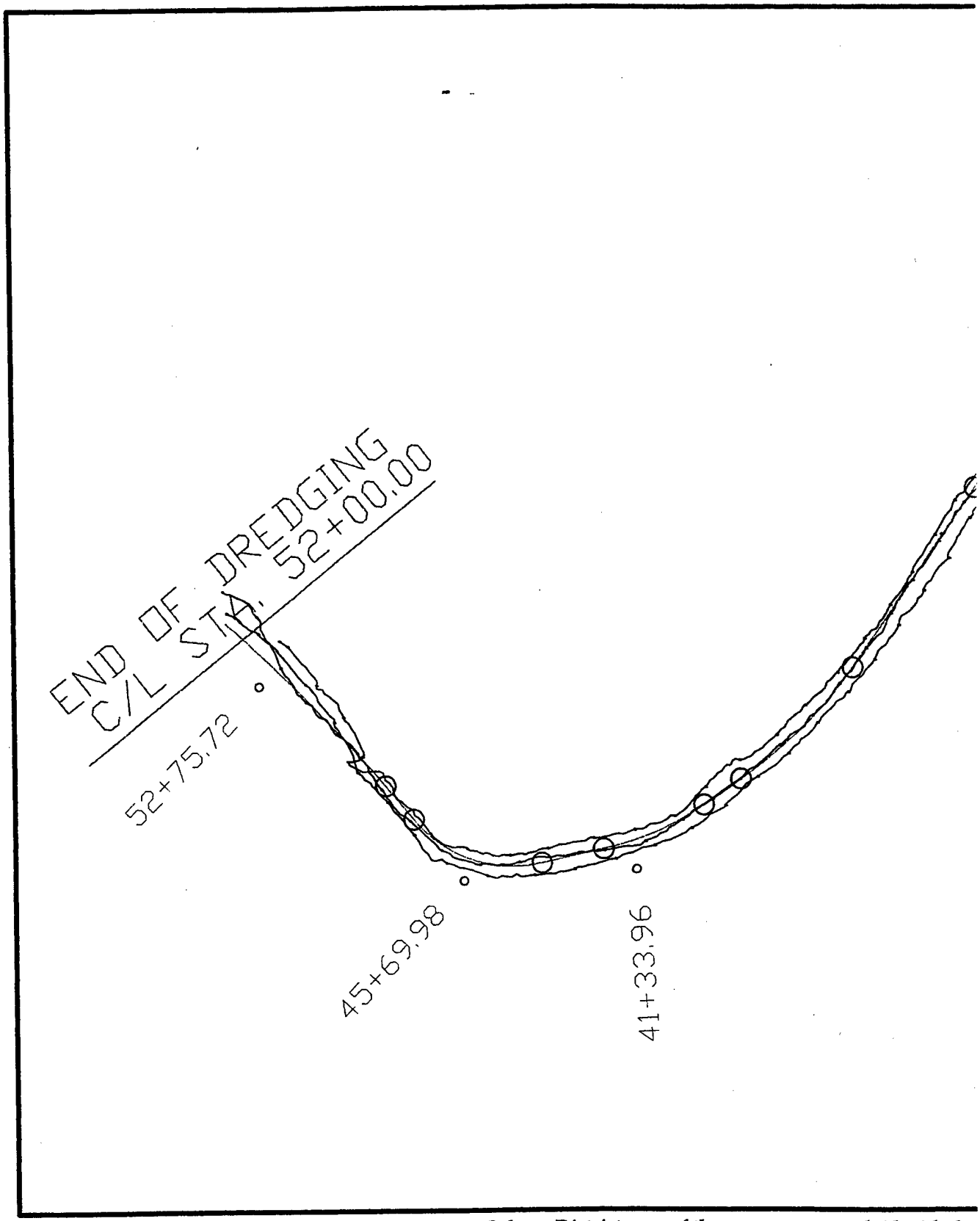
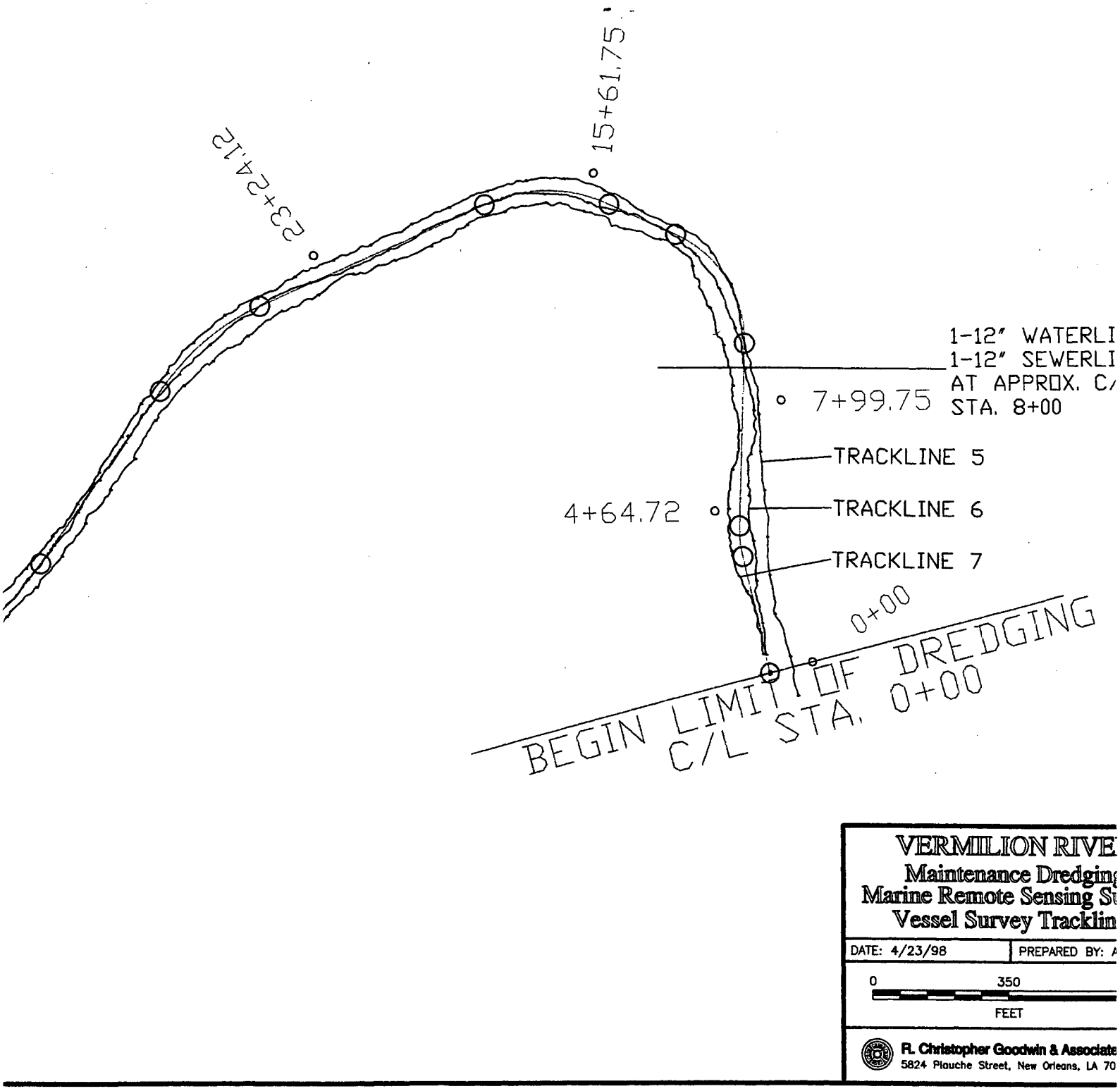
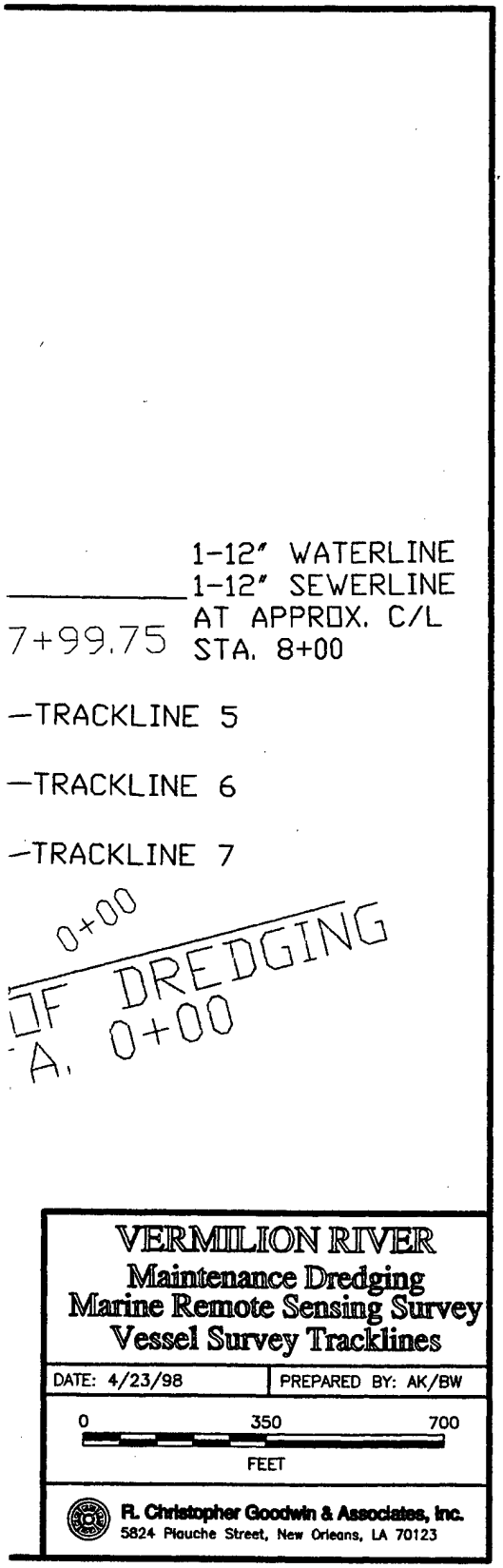


Figure 22. ***The U.S. Army Corps of Engineers, New Orleans District map of the survey area overlaid with the circles on this graphic represent navigation control points.***



overlaid with the tracklines of the survey vessel. The

(2)


1-12" WATERLINE
1-12" SEWERLINE
AT APPROX. C/L
7+99.75 STA. 8+00
-TRACKLINE 5
-TRACKLINE 6
-TRACKLINE 7
0+00
DREDGING
A. 0+00
VERMILION RIVER
Maintenance Dredging
Marine Remote Sensing Survey
Vessel Survey Tracklines
DATE: 4/23/98
PREPARED BY: AK/BW
0
350
700
FEET
R. Christopher Goodwin & Associates, Inc.
5824 Plauche Street, New Orleans, LA 70123

(3)

Table 3. Inventory of Magnetic Anomalies from the Vermilion River Marine Remote Sensing Survey (X/Y Coordinates Reference the LA [South] State Plane Grid and NAD-83).

ANOM #	LINE	DATE	START TIME	END TIME	GAMMA	SIGNATURE	DURATION	START X	START Y	END X	END Y	CORRELATIONS
1	5	4/15/98	11:16:59	11:17:18	96.0	M	0.19	3059262.8	614093.5	3059709.0	613926.9	Concrete and metal debris on bank
2	5	4/15/98	11:17:18	11:18:29	1,980.5	D	1.11	3059732.4	613924.9	3059776.6	613909.0	Iron bulkhead
3	5	4/15/98	11:18:52	11:19:00	440.5	M	0.08	3059916.2	613861.2	3059969.0	613867.3	None
4	5	4/15/98	11:19:19	11:21:45	167.5	M	1.26	3060077.6	613898.7	3060565.7	614670.1	Iron fasteners in wooden bulkhead
5	5	4/15/98	11:23:43	11:23:49	526.5	D	0.06	3060625.5	615401.9	3060639.0	615443.8	None
6	5	4/15/98	11:24:05	11:25:27	187.5	M	1.22	3060664.6	615529.9	3060912.1	615978.4	Concrete and metal debris on bank
7	5	4/15/98	11:25:43	11:26:16	10,203.0	M	0.33	3060978.4	616069.8	3061079.4	616235.4	Iron bulkhead
8	5	4/15/98	11:27:42	11:27:53	424.5	M	0.11	3061583.7	616404.4	3061633.0	616364.6	Boat launch
9	5	4/15/98	11:28:17	11:28:19	36,098.0	N	0.02	3061755.3	616281.6	3061764.2	616272.7	Over head electrical power lines
10	5	4/15/98	11:29:06	11:29:15	1,926.5	D	0.09	3061950.7	616047.6	3061967.3	615991.4	Concrete and metal debris on bank
11	6	4/15/98	10:48:45	10:49:41	143.5	M	0.56	3059206.6	614141.0	3059725.5	613934.7	Concrete and metal debris on bank
12	6	4/15/98	10:49:41	10:49:52	2,323.0	D	0.11	3059725.5	613934.7	3059789.8	613910.1	Iron fasteners in wooden bulkhead
13	6	4/15/98	10:50:02	10:51:13	158.5	M	1.11	3060668.5	613900.5	3060286.9	614107.7	Iron fasteners in wooden bulkhead
14	6	4/15/98	10:54:58	10:55:36	537.0	M	0.38	3060668.5	615655.3	3060820.4	615887.8	Iron bulkhead
15	6	4/15/98	10:56:55	10:57:01	39,206.5	D	0.06	3061150.1	616342.7	3061208.1	616377.1	Boat ramp and iron pipes
16	6	4/15/98	10:58:38	10:58:39	30,236.0	N	0.01	3061817.6	616280.3	3061824.2	616270.8	Over head electrical power lines
17	7	4/15/98	11:01:41	11:01:58	315.0	M	0.17	3062364.9	615678.4	3062256.3	615762.7	Concrete and metal debris on bank
18	7	4/15/98	11:03:00	11:03:22	416.0	M	0.22	3061934.9	616174.4	3061800.9	616312.6	Over head electrical power lines
19	7	4/15/98	11:04:38	11:04:57	1,081.0	M	1.19	3061269.6	616441.1	3061166.9	616401.4	Boat launch
20	7	4/15/98	11:05:08	11:10:52	1,661.5	M	5.44	3061093.4	616342.7	3060412.1	614369.5	Adjacent to iron and wooden bulk heads
21	7	4/15/98	11:11:31	11:13:50	76.0	M	2.19	3060309.8	614172.0	3059491.6	614059.3	Iron fasteners in wooden bulkhead

Figure 23. ***Composite bulkheads fabricated from steel and wood that line the riverbank along much of the Vermilion River survey area were a frequent source of the large magnetic disturbances recorded during the survey.***

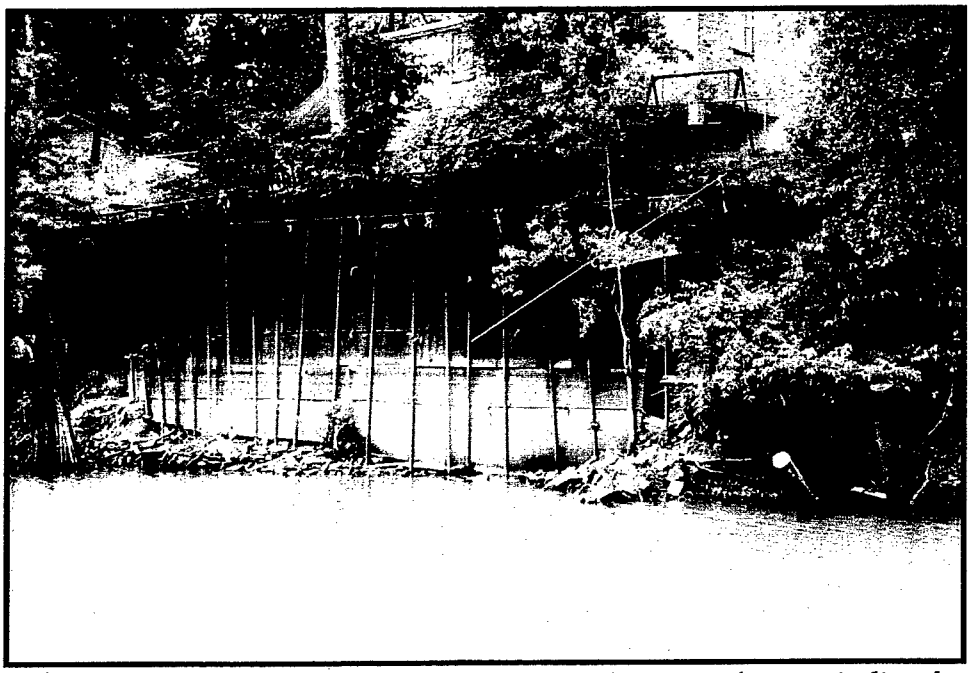


Figure 24. ***Photograph of the survey area illustrating several sources of magnetic disturbance: concrete debris, a bulkhead, and a residence.***

Figure 25. ***Photograph of a bankline in the Vermilion River survey area illustrating several sources of magnetic disturbance along the riverbank: a large iron outflow pipe, concrete and steel re-bar debris, and overhead electrical powerlines.***

Table 4. Inventory of Acoustic Anomalies from the Vermilion River Marine Remote Sensing Survey.

ANOM. #	LINE	DATE	TIME	DESCRIPTION	OFFSET PORT\STBD	CORRELATIONS
1	1	4/15/98	11:17:59	30 ft area of linear objects	37.8 ft starboard	M2
2	1	4/15/98	11:27:00	Small anomaly with an elevation of 4 ft off the bottom	21.6 ft port	None
3	2	4/15/98	10:51:54	20 ft curvilinear target overlain by a 30 ft linear target	62.1 ft port	None
4	2	4/15/98	10:57:04	Acoustic surface reflection from a pontoon boat	40.1 ft port	None
5	2	4/15/98	10:57:26	5 ft linear anomaly adjacent to the boat ramp	22.2 ft port	None
6	3	4/15/98	11:05:03	End of the current deflection wall at the boat ramp	24.3ft starboard	M19
7	3	4/15/98	11:05:04	Center line of the boat ramp	35.8 ft starboard	M19
8	3	4/15/98	11:07:32	Acoustic surface reflection from a pontoon boat	29.3 ft starboard	M20
9	3	4/15/98	11:08:38	Center of small boat slip recessed into bulkhead	37.5 ft starboard	M20
10	3	4/15/98	11:14:04	Linear anomaly parallel to the center line	42.4 ft port	None

the result of isolated ferrous debris and have little potential to be significant, submerged cultural resources.

Acoustic Data

A total of 10 acoustic anomalies were detected during the side scan survey of the project area (Table 4). These anomalies fell into two categories: modern features visible from the survey vessel (A4, A6, A7, A8, A9, and A10) and

isolated targets also representative of modern debris (A1, A2, and A5). Target A3 is composed of tree limbs snagged on a submerge tree trunk. The presence of modern features and scattered debris throughout the project area confirmed the trends observed within the magnetic data.

Bathymetric Data

No bathymetric anomalies were recorded during the Vermilion River marine remote sensing survey of the Vermilion River project corridor.

Terrestrial Survey Results

A total of three archeological sites (16LY94, 16LY95, and 16LY97), two non-site cultural resources loci (4-1 and 5-1), and one standing structure older than 50 years in age (SS 669) were identified during the Phase I cultural resources survey and archeological inventory of the proposed 35 ac (14.2 ha) dredged material disposal area in Lafayette Parish, Louisiana (Figure 26; Table 5). State site and standing structure forms have been completed and submitted to the Louisiana Department of Culture, Recreation, and Tourism, Office of Cultural Development, Divisions of Archaeology and Historic Preservation for each of the newly recorded sites and the standing structure. These resources are discussed below.

Non-Site Cultural Resources Loci

The Phase I cultural resources survey and archeological inventory of the proposed dredged material disposal area resulted in the identification of two cultural resources loci that did not merit archeological site status. Each of these two loci contained fewer than five artifacts.

Locus 4-1

Locus 4-1 is located in a cow pasture in the northwest corner of the proposed Vermilion River dredged material disposal area. It lies approximately 150 m (492.1 ft) from the Vermilion River on the eastern sloping edge of a small ridge between Anselm Coulee and the Vermilion River (Figures 26 and 27). During the initial Phase I cultural resources survey, a single pre historic lithic flake was recovered from an excavated shovel test. A total of six additional shovel tests and two auger tests were excavated in the vicinity of this find during the subsequent locus

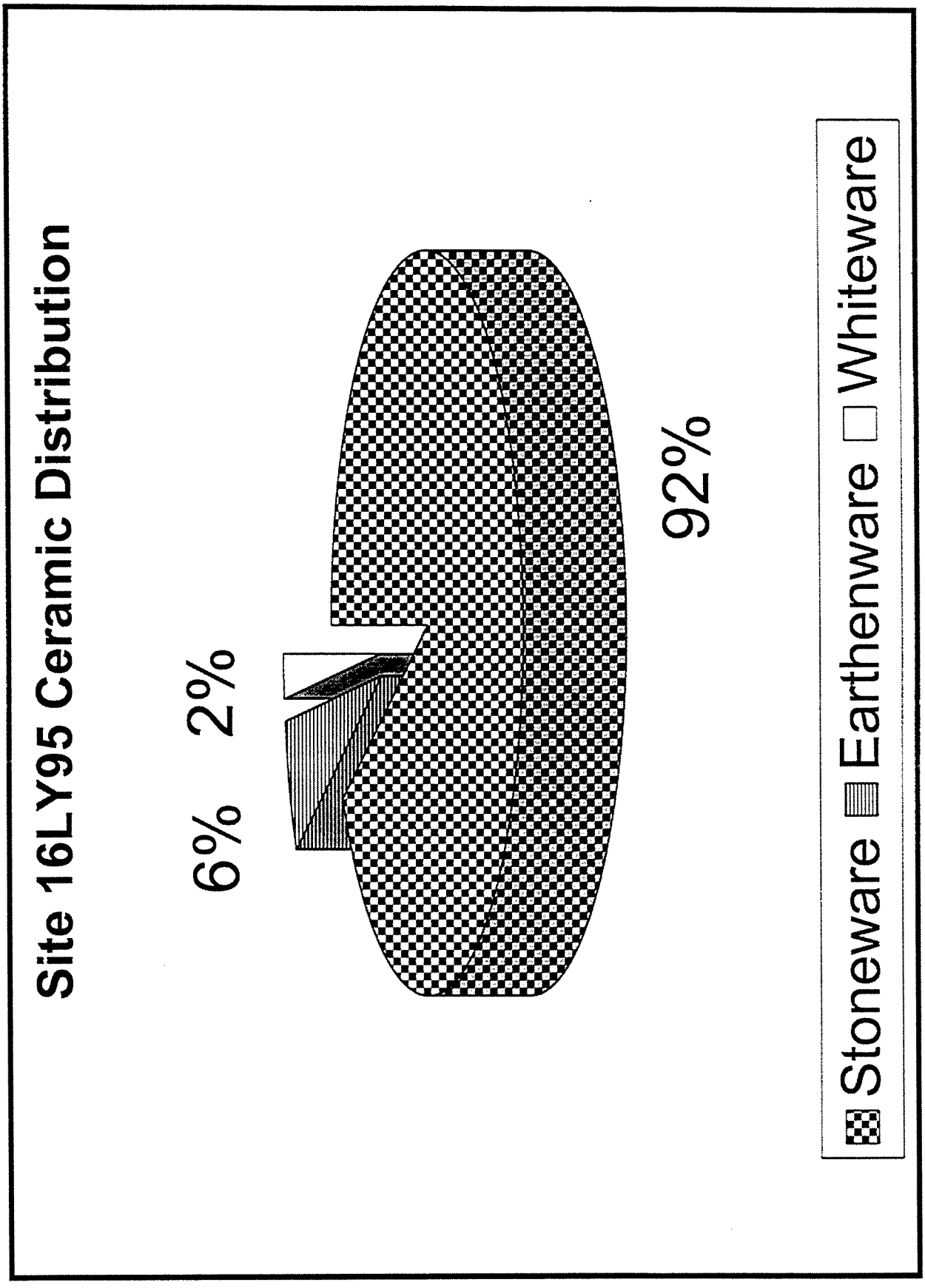


Figure 26. Site 16LY95 ceramic distribution.

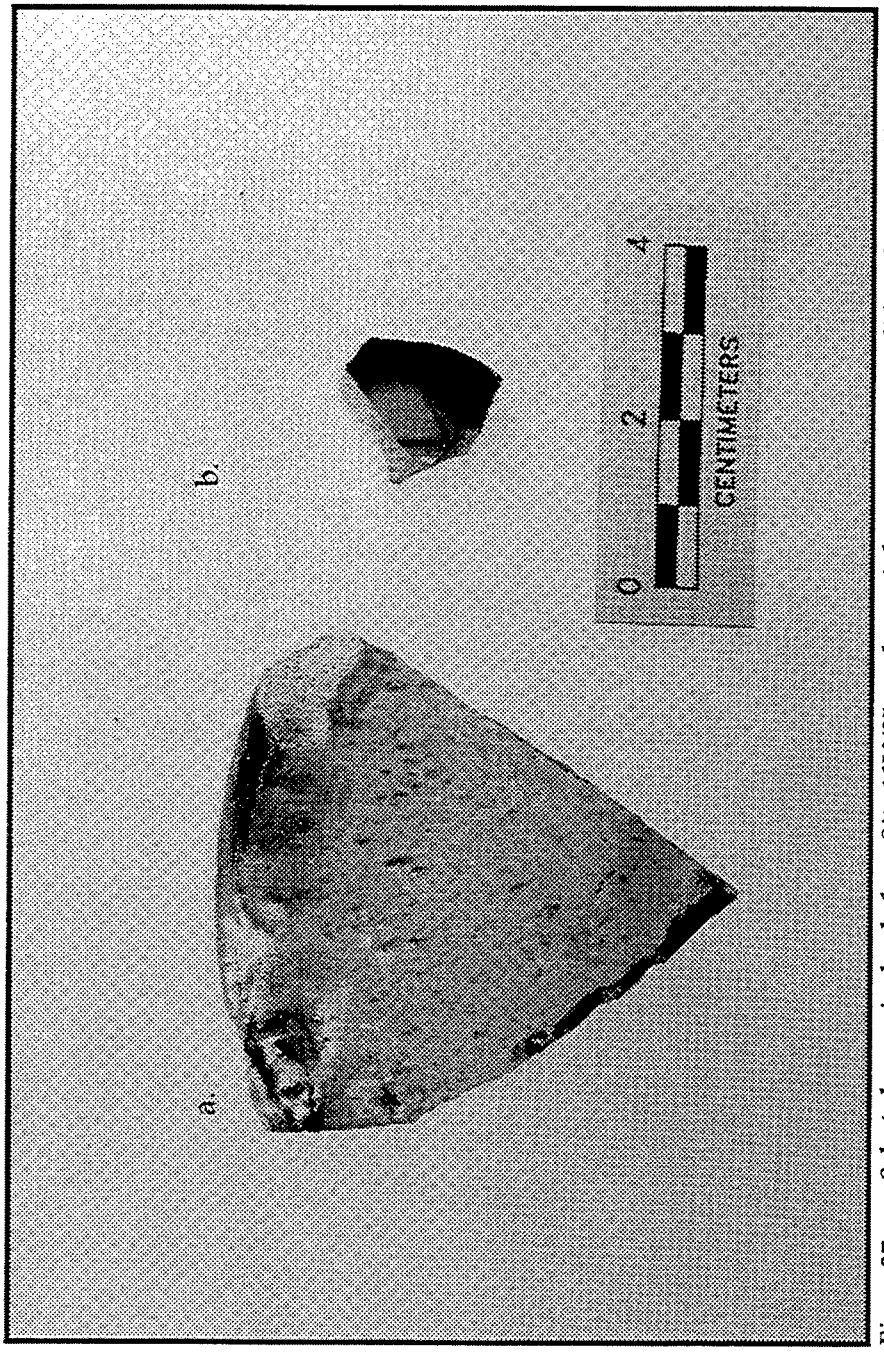


Figure 27. Selected ceramic sherds from Site 16LY95: a. domestic brown stoneware lid with sponged/spattered decoration (FS# 18); b. whiteware sherd with flow-blue decoration (FS# 18).

Table 5. Cultural Resources Loci and Archeological Sites Identified during Phase I Survey and Inventory of the Terrestrial Portion of the Proposed Vermilion River Dredge Maintenance Project.

SITE/ LOCUS NO.	USGS 7.5' QUADRANGLE AND UTM COORDINATES	SECTION/ TOWNSHIP/ RANGE	SITE SIZE	DESCRIPTION	DEPOSITIONAL INTEGRITY	NRHP STATUS
VERMILION PARISH						
Cultural Resource Loci:						
4-01	Milton, Louisiana 1983 E589580 N3328360	Section 50 Township 11S Range 4E	n/a	Isolated prehistoric lithic flake	Destroyed	Isolate
5-01	Milton, Louisiana 1983 E590170 N3328580	Section 50 Township 11S Range 4E	n/a	Isolated brick fragments	Destroyed	Isolate
Archeological Sites:						
Site 16LY94	Milton, Louisiana 1983 E590040 N3328420	Section 50 Township 11S Range 4E	3.0 ac (1.2 ha)	Early nineteenth to early twentieth century historic period artifact scatter	Poor	Not eligible
Site 16LY95	Milton, Louisiana 1983 E589900 N3328530	Section 50 Township 11S Range 4E	0.2 ac (0.08 ha)	Mid-nineteenth to twentieth century historic period artifact scatter.	Poor	Not eligible
Site 16LY97	Milton, Louisiana 1983 E589470 N3328250	Section 50 Township 11S Range 4E	1.2 ac (0.5 ha)	Nineteenth to twentieth century cemetery	Intact	Not eligible

delineation process. None of these shovel tests or auger tests contained cultural material or produced evidence of intact cultural features. Locus 4-1 does not possess research potential. The locus does not possess the qualities of significance as defined by the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]). No additional testing of this locus is recommended.

Locus 5-1

Locus 5-1 was identified in the northeast corner of the project area. It was located near a modern farmstead situated in the eastern half of the proposed dredged material disposal area (Figures 26 and 28). Several brick fragments were observed in a shovel test excavated during the initial cultural resources survey. Ms. Victoria Bourque reported that a structure once was located in the vicinity (Bourque 1998, personal communication). A total of 4 shovel tests were excavated at Locus 5-1 during the subsequent locus delineation process. None of the delineation shovel tests produced cultural material or evidence of intact cultural features. These results demonstrate that Locus 5-1 lacks research potential. It does not possess the qualities of significance as defined by the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]). No additional testing of the locus is recommended.

Standing Structures

During the Phase I cultural resources survey, only one standing structure older than 50 years in age was identified. The structure is described below.

Standing Structure 1

Standing Structure 1 (SS 669) is associated with the modern farm complex located in the northeast corner of the project area (Figures 26, and 29 - 31). It consists of a small 8 x 15 m (26.2 x 49.2 ft) barn with a double-pitched, front-gabled roof (Louisiana Historic Standing Structure Form in Appendix I). Tin siding has replaced much of the original wood exterior on the structure. Where the original cladding still was visible, however, it appeared to consist of vertical boards. The owner of the barn, Ms. Victoria Bourque, stated that it was once a part of the original farm complex. She also noted that the barn is in its original location (Bourque 1998, personal communication). While the date of construction of the building currently is not known, it appeared to data from the early to mid-twentieth century. No unique architectural features or attributes were observed on the barn.

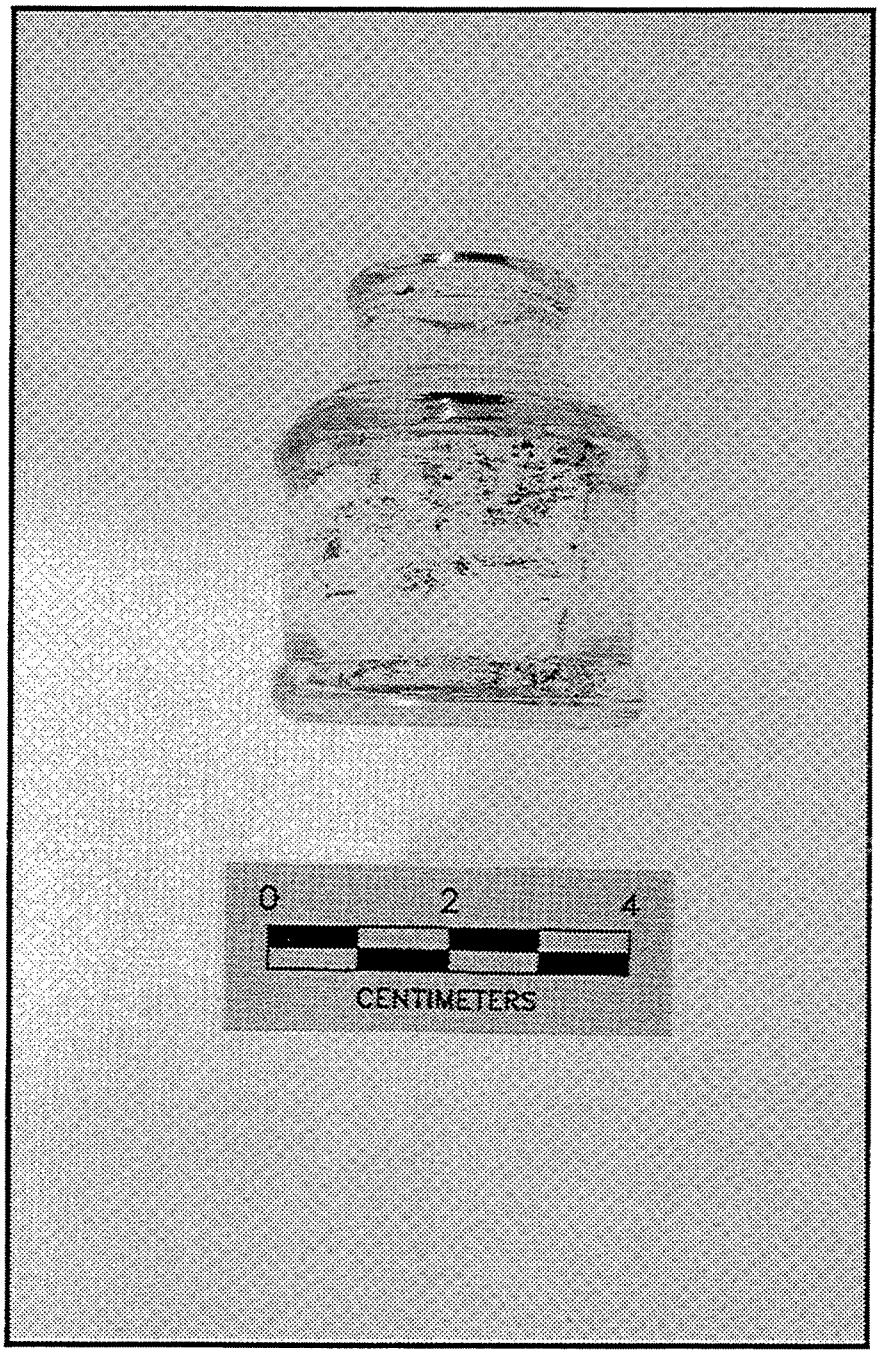


Figure 28. Machine-made glass bottle from Site 16LY95 (FS# 19).

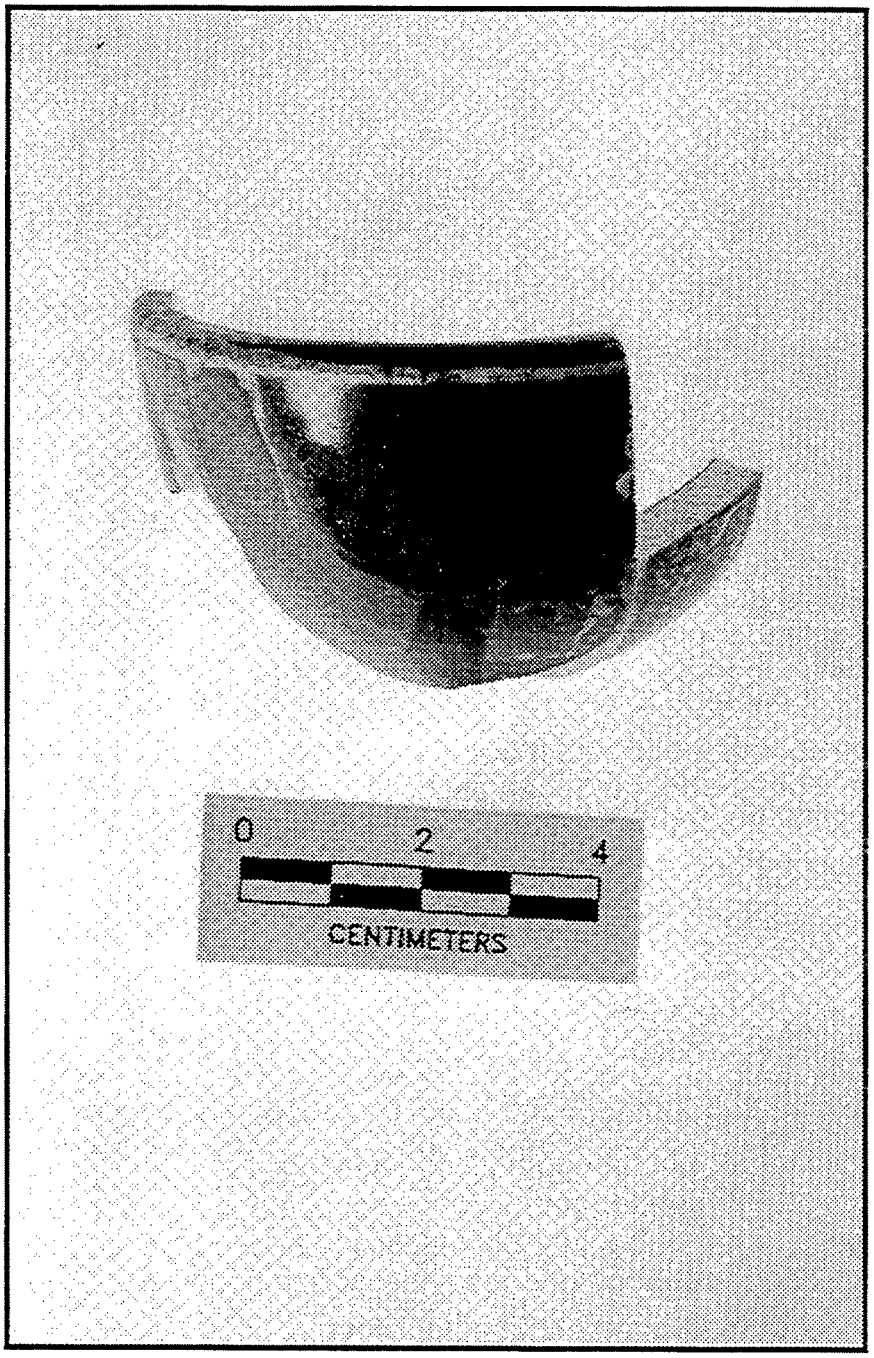


Figure 29. Three mended sherds of an unidentified burned earthenware vessel from Site 16LY95 (FS# 19).

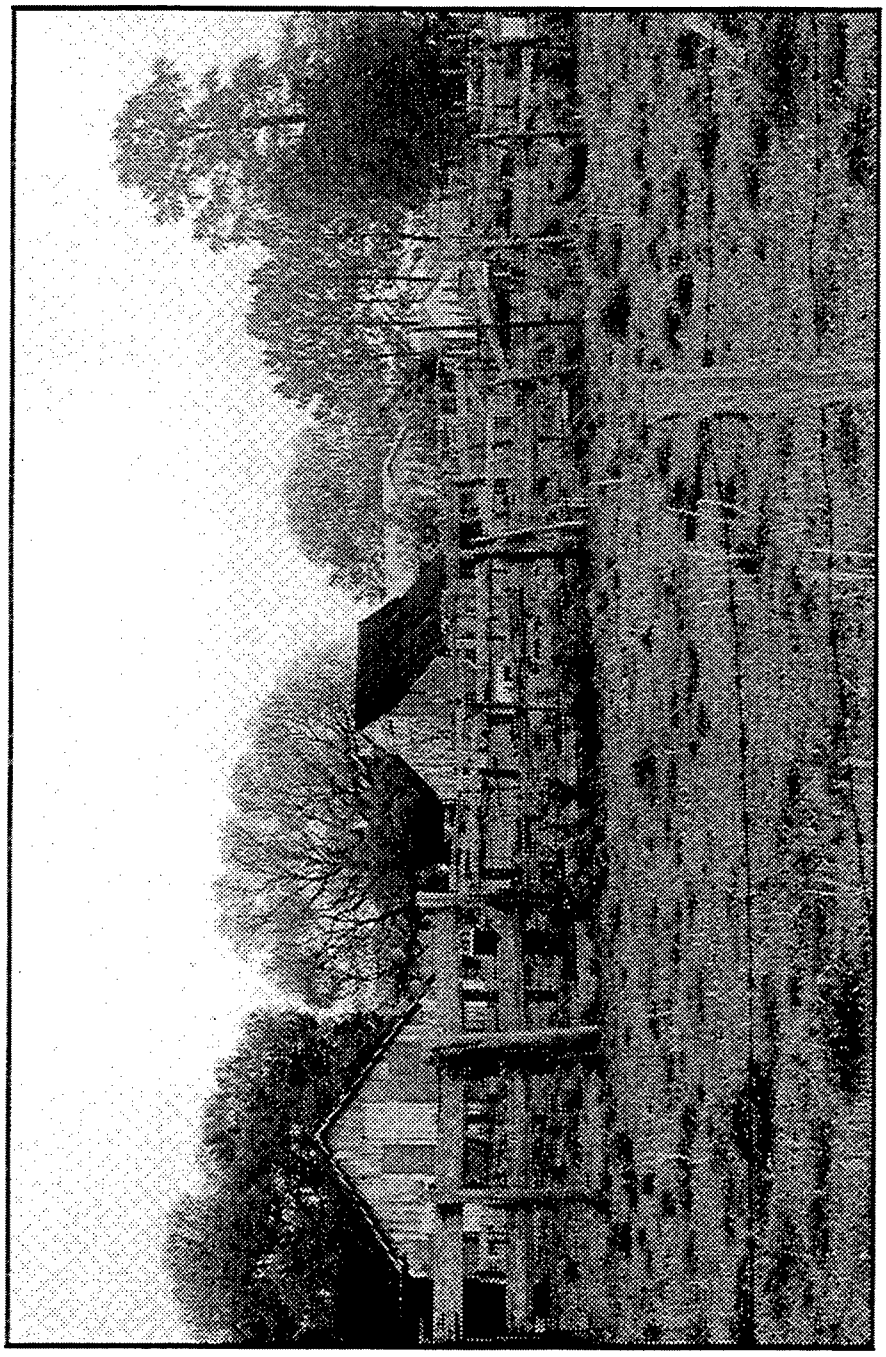


Figure 30. Northeast View of Bourque Outbuilding Complex.

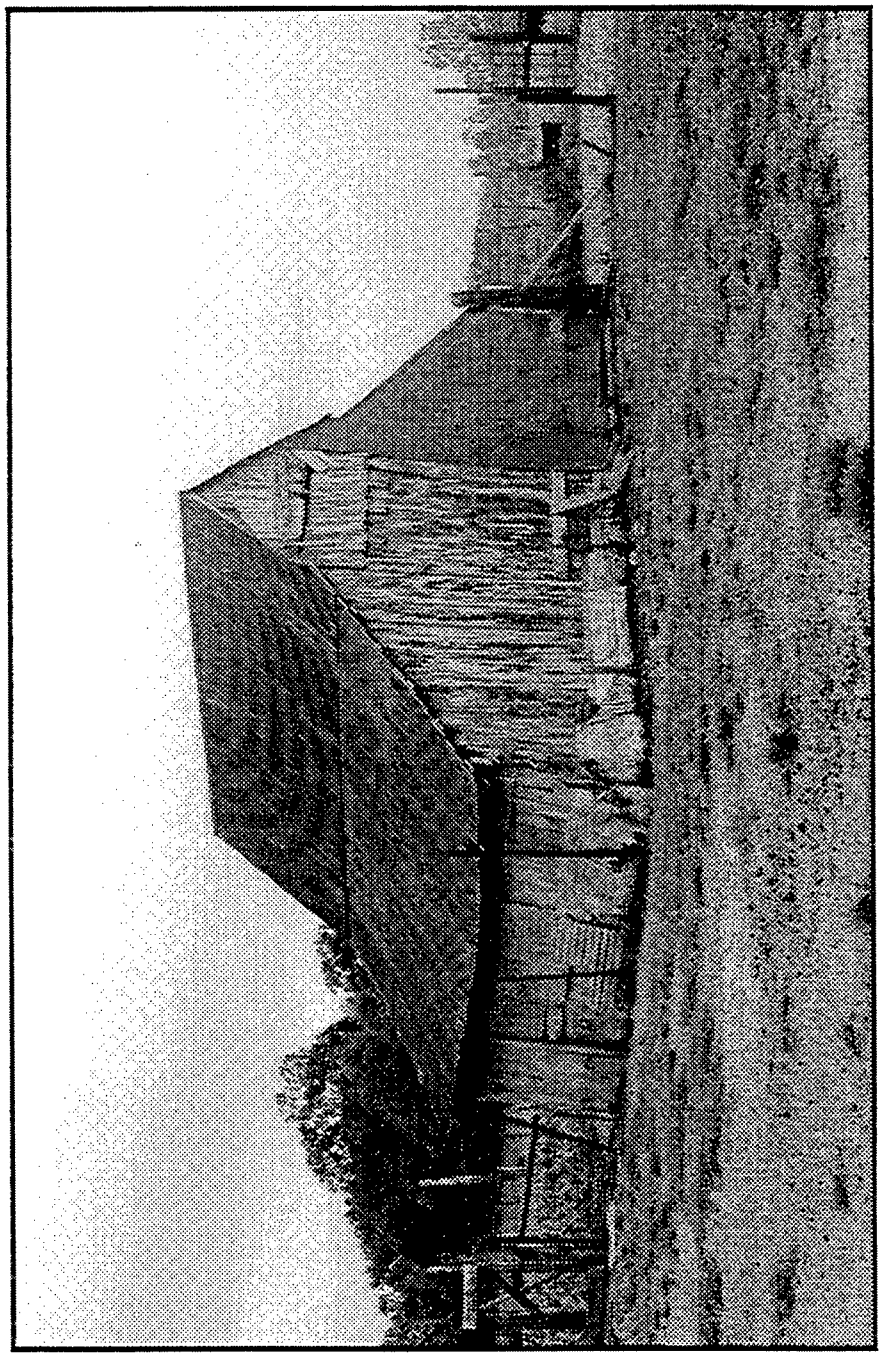


Figure 31. Southeast View of Bourque Barn (Standing Structure 1).

This structure represents a typical example of a locally and regionally common barn type. It possesses no known historical associations of transcending importance and it is not locally significant. It does not possess the qualities of significance as defined by the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]). No additional architectural recordation of SS 669 is recommended.

Archeological Sites

A total of three cultural resources loci that were identified during the Phase I cultural resources survey and archeological inventory of the proposed dredged material disposal area merited archeological site status.

Site 16LY94

Site 16LY94 is located in a cow pasture in Section 50, of Township 11S, Range 4E. It occupies a ridge that overlooks the Vermilion River, and it lies at an elevation of 6.1 m (20 ft) NGVD (Figures 32 and 33). Site 16LY94 is ovoid in configuration and it encompasses an area that measures 3.0 ac (1.2 ha) in size. It is bounded to the north by a farm complex, and to the east, south, and west by additional pasture. Anselm Coulee lies approximately 150 m (492 ft) to the west of Site 16LY94. A total of 62 historic period artifacts, consisting of 23 ceramic sherds, 17 glass shards, 6 brick fragments, 15 metal objects, and a single shell, were recovered from the site area (Figure 34; Appendix I).

A total of 100 of 103 planned shovel tests were excavated successfully in the vicinity of Site 16LY94; three shovel tests were not excavated since they fell within the adjacent farm complex. A total of 26 shovel tests produced cultural material. A total of 62 artifacts were recovered including 23 ceramic sherds and 17 glass shards. This material is summarized in Table 6. The highest concentration of artifacts and brick fragments occurred in a northeast-southwest trending pattern across the middle of the site. The oldest diagnostic artifacts at the site were recovered from Stratum II in this area; these included a scalloped rim, impressed curved lines whiteware sherd (ca. 1820 - 1845) and a mold decorated ironstone sherd (ca. 1840 - 1900) (Figure 35).

A level, square-shaped rise in the terrain was observed in the vicinity of Shovel Test N1015/E1000; it may represent the former location of a structure at Site 16LY94. This rise also could represent a previously enclosed area that has not been trampled by grazing cattle. Brick fragments were recovered from this area, and they were observed scattered throughout the site area, but no evidence of intact architectural features was identified. The property owner, Ms. Victoria Bourque, reported that three historic residential dwellings once occupied the hilltop in the vicinity of the rise (Bourque 1998, personal communication). Ms. Bourque did not know when these houses were constructed or demolished. The artifact assemblage recovered from Site 16LY94 was composed primarily of domestic ceramics and glass, suggesting that a dwelling may once have occupied this location. Refined earthenwares, consisting of whiteware, ironstone, and pearlware, dominated the ceramic assemblage, comprising 70 percent of the recovered ceramic sherds (Figures 36 and 37).

A typical shovel test at Site 16LY94 was excavated to a depth of 50 cmbs (19.7 inbs), and it exhibited two strata in profile (Figure 38). According to Ms. Bourque, the project parcel had been cultivated during her lifetime. Stratum I, therefore, was interpreted as the plow zone. The plow zone consisted of a layer of grayish brown (10YR 5/2) silty loam that extended from 0 to 25 cmbs (0 to 9.8 inbs). It was underlain by Stratum II, a dark grayish brown (10YR 4/2) silty clay loam that extended from 25 to 50 cmbs (9.8 to 19.7 inbs). Cultural material was recovered from a number of shovel tests at depths ranging from 0 to 50 cmbs (0 to 19.7 inbs). A majority of this material, however, originated from Stratum I, i.e., from within the plow zone. Only 18 artifacts were collected from Stratum II. A number of small brick fragments also were observed in Stratum II.

This site may be associated with the former location of an early nineteenth to early twentieth century domestic dwelling that does not appear on early twentieth century maps of the property. No cultural features were identified and only a low density of historic period artifacts were recovered during the Phase I cultural resources survey and archeological inventory of Site 16LY94. The relatively sparse artifact scatter present at the site may represent the remains of a sheet midden formed in the yard of the former structure. The destruction of this dwelling and the subsequent plowing of the area has compro-

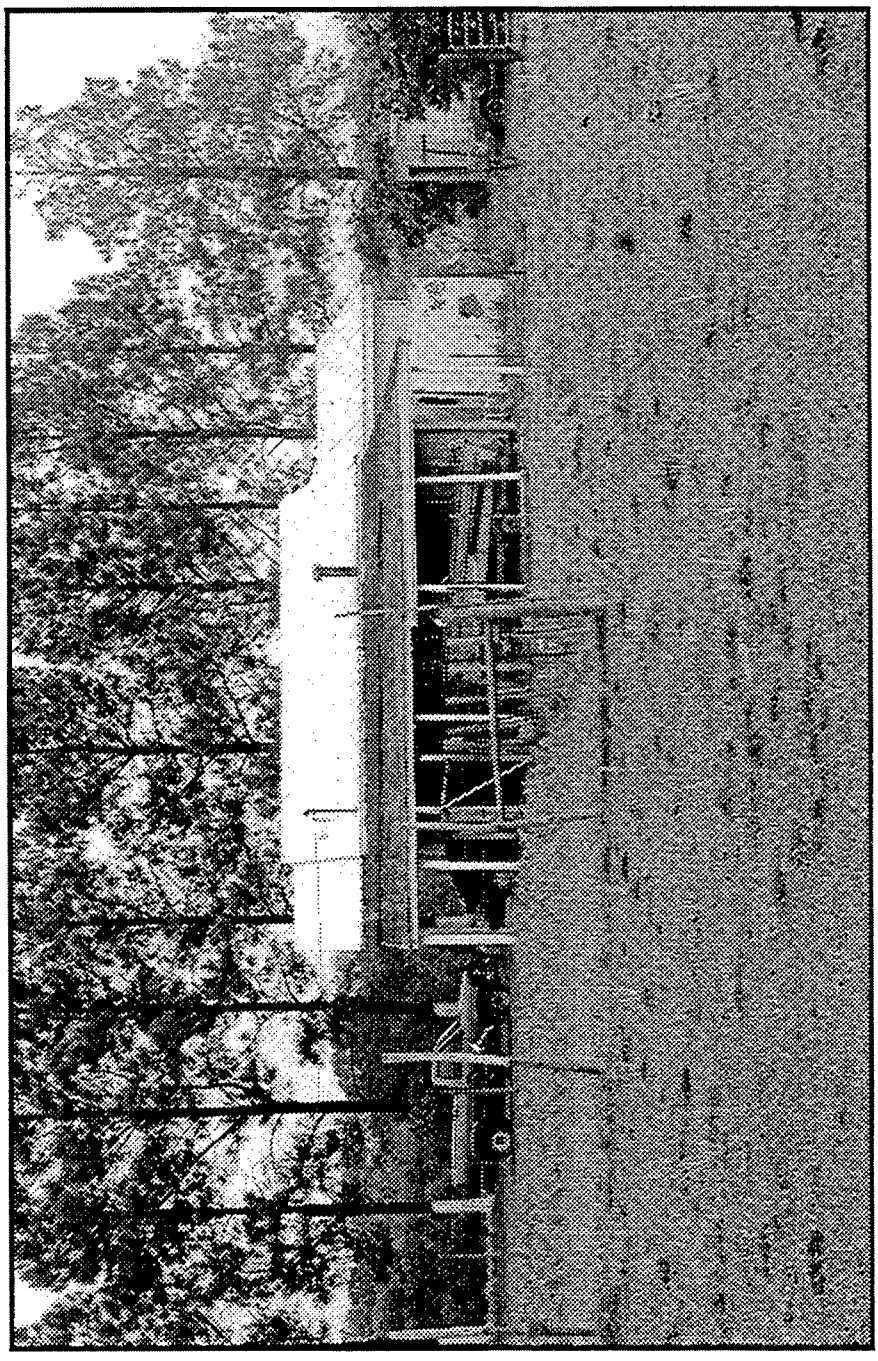


Figure 32. West View of Bourque Residence.

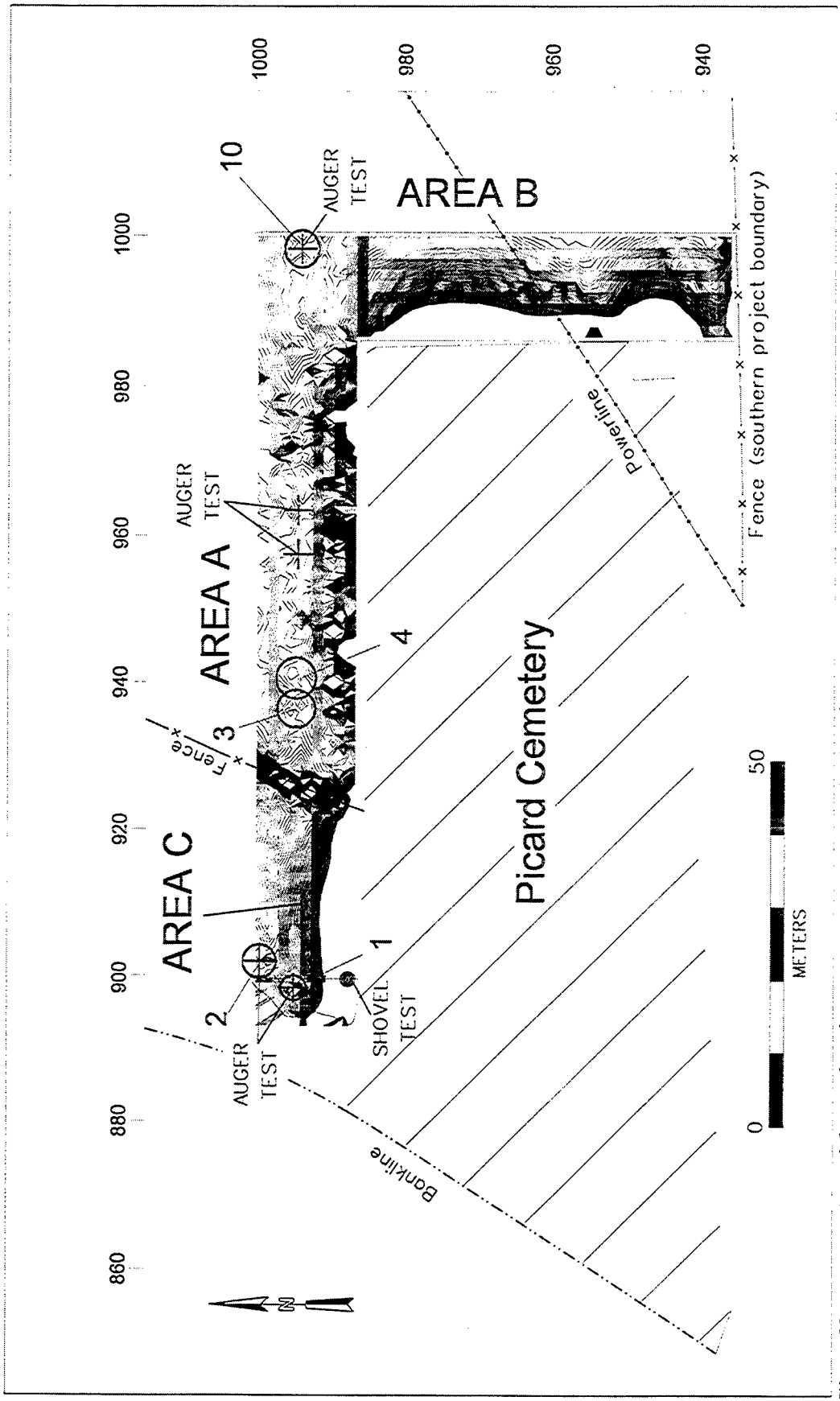


Figure 33. Overview of the results of magnetometer survey and subsurface testing at Site 16LY97.

Figure 34. View of Feature 1 at Site 16LY97.

Table 6. Historic Artifacts Recovered during Phase I Survey of Site 16LY94.

CLASS	TYPE	SUBTYPE	GENERAL DATE RANGE	TOTAL
Ceramic	Cream-Colored Ware (Earth-enware)	Plain		2
	Domestic Brown Stoneware	Salt-Glazed w/Int. Albany Slip-glazed on Buff-body		1
		Salt-glazed w/Int. Lead Glaze on Buff		1
	Domestic Gray Stoneware	Lead-glazed		1
	Ironstone	Mold Decorated		1
		Transfer-printed		1
		Undecorated White		3
	Pearlware	"Willow" Transfer-printed		1
		Undecorated		1
	Tin-Enamelled Earthenware	Faience		1
	Whiteware	Plain		6
		Scalloped Rim, impressed curved lines		1
		Underglaze Hand-painted		1
		Unscalloped, unmolded		1
	Yellowware	Sponged/Spatter Decorated		1
Ceramic Total				23
Construction Materials	Architectural Stone	Brick Fragment(s)		3
		Brick, Shiner		3
Construction Materials Total				6
Glass	Lamp Glass	Colorless		1
	Machine-Made Bottle Glass	Amethyst-colored (Manganese Solarization)		1
	Pressed Glass	Yellow		1
	Unid. Molded Technique	Amethyst-colored (Manganese Solarization)		1
		Dark Green		5
		Light Aqua		2
		Yellow Green (Olive)		3
	Unidentified Glass shard(s) (Kitchen)	Colorless		1
		Light Aqua		1
	Window Glass shard(s)			1
Glass Total				17
Metal	Construction Hardware	Bolt(s) and/or Bracket(s)		1
		Spike(s)		1
	Furniture	Stove Part(s)		1
	Miscellaneous Hardware	Barbed Wire fragment(s)		9
	Unidentified Metal	Iron/Steel		2
		Unidentified Lead Object(s)		1
Metal Total				15
Shell	Shell (Miscellaneous)	Rangia Shell		1
Shell Total				1
Grand Total				62

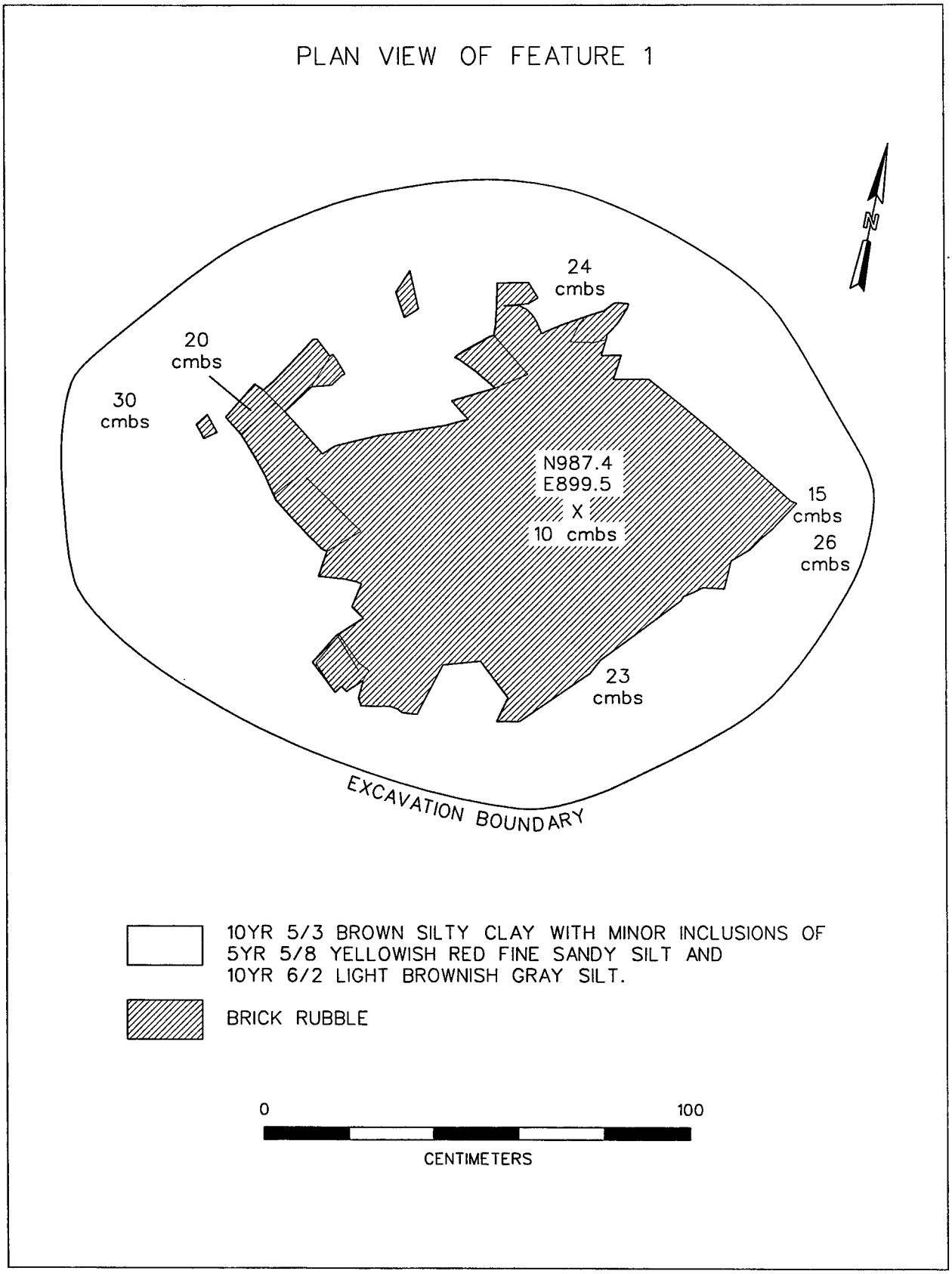


Figure 35. Plan View of Feature 1 at Site 16LY97.

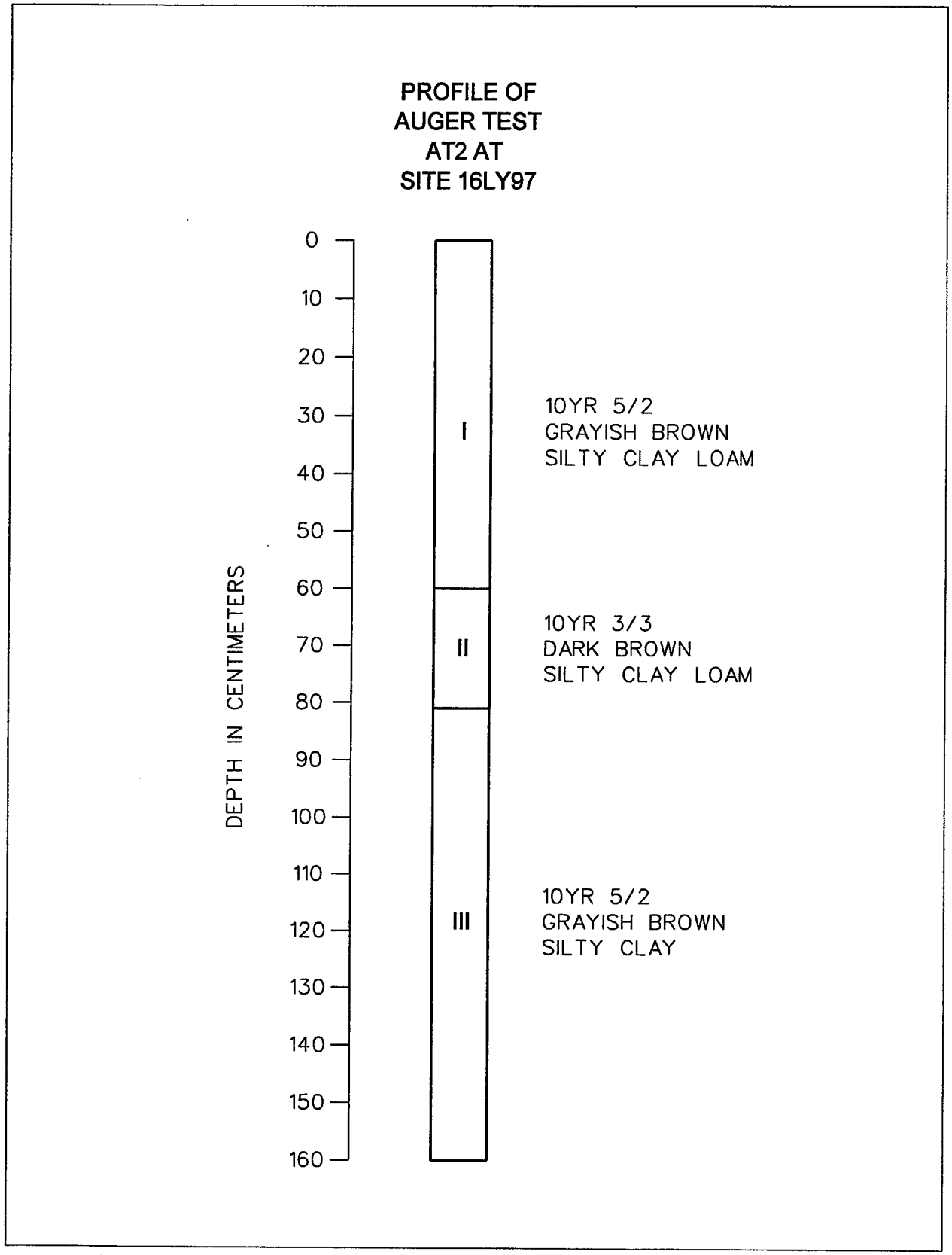


Figure 36. Profile of Auger Test AT2 at Site 16LY97.

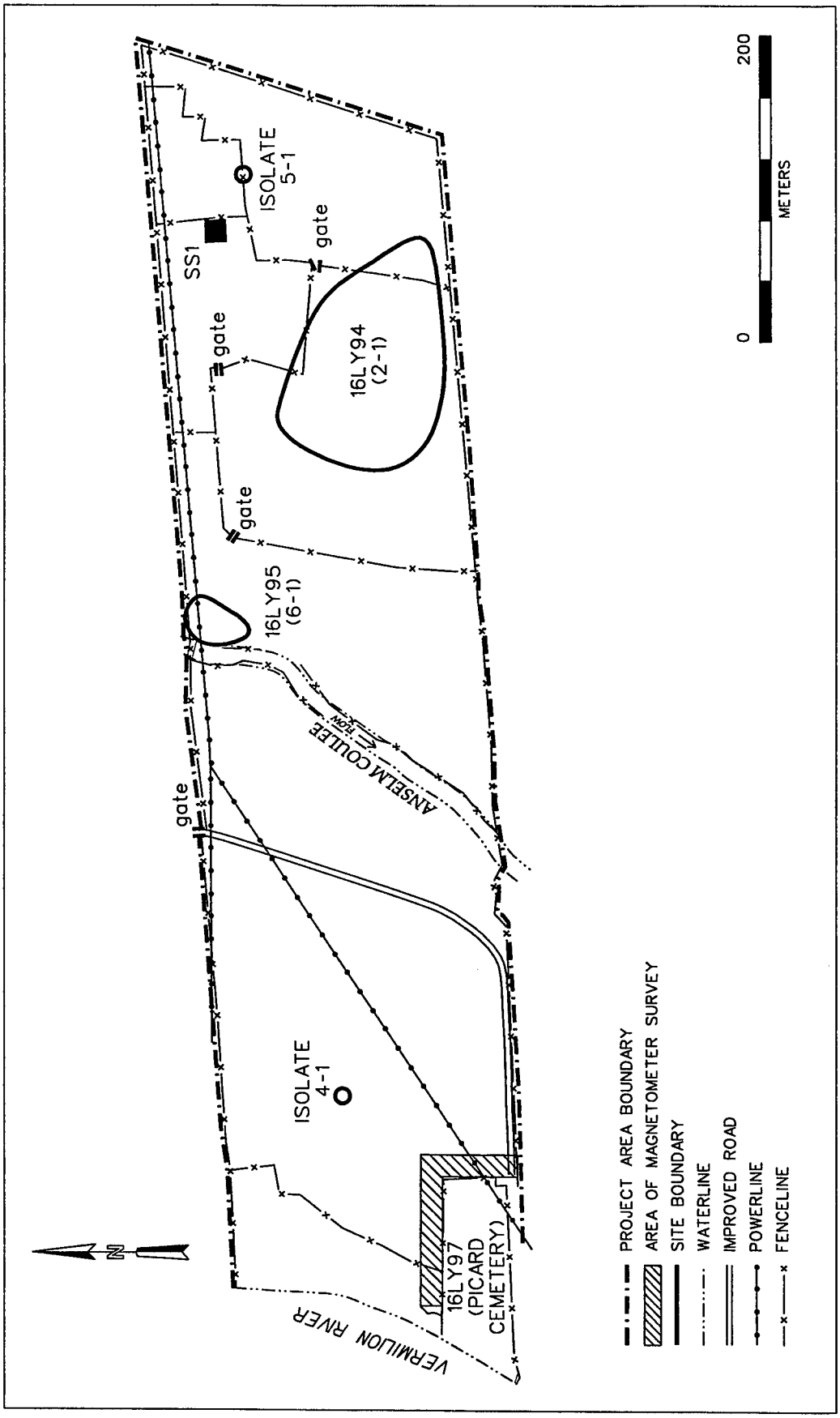


Figure 37. Overview map depicting the proposed Vermilion River Maintenance dredged material disposal area and cultural resources identified during Phase I cultural resources survey and inventory.

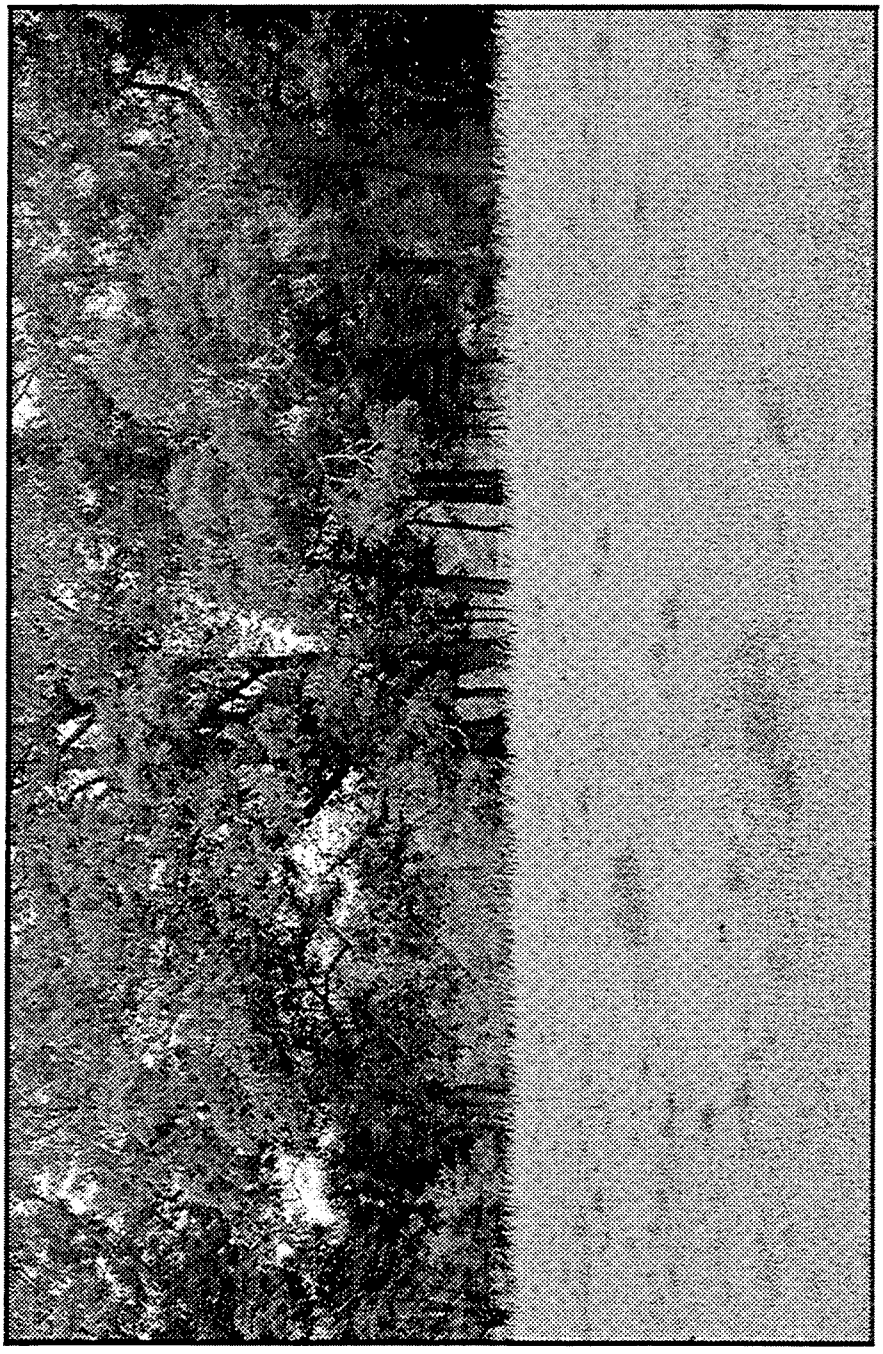


Figure 38. West View of Cultural Resource Locus 4-1.

mised the integrity of the cultural deposits. Site 16LY94 possesses only minimal research potential; it does not possess the qualities of significance as defined by the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]). No additional archeological testing of Site 16LY94 is recommended.

Site 16LY95

Site 16LY95 is located in a cow pasture in Section 50, of Township 11S, Range 4E (Figures 39 and 40). It occupies the floodplain of Anselm Coulee at the base of a gentle slope at an elevation of 1.5 m (5 ft) NGVD. Site 16LY95 is ovoid in configuration and it encompasses an area that measures 0.2 ac (0.08 ha) in size. It is bounded to the west by Anselm Coulee, to the north by a mixed hardwood forest, and to the east and south by additional pasture. A total of 148 historic period artifacts were recovered from shovel tests and from the surface of the site. This material included 52 ceramic sherds, 1 brick fragment, 67 glass shards, and 28 metal objects (Figure 41; Table 7; Appendix I).

A total of 20 shovel tests were excavated in the vicinity of Site 16LY95. At least seven of these shovel tests fell within the site boundary, but only four of these shovel tests produced cultural material. Together, these shovel tests produced 120 of the 148 artifacts recovered from the site. In

Table 7. Historic Artifacts Recovered during Phase I Survey of Site 16LY95.

CLASS	TYPE	SUBTYPE	TOTAL
Ceramic	Domestic Brown Stoneware	Opaque Glaze on Buff	5
		Opaque Glaze w/Int. Albany Slip-glaze on Buff	5
		Salt-glazed w/Int. Lead Glaze on Buff	37
		Sponge/Spatter on Buff	1
	Unidentified Ceramics	Unidentified Burned Earthenware	3
	Whiteware	Flow Blue	1
Ceramic Total			52
Construction Materials	Architectural Stone	Brick Fragment(s)	1
Construction Materials Total			1
Glass	Cup Bottom Mold	Amethyst-colored (Manganese Solarization)	3
	Lamp Glass	Colorless	1
	Lettered-plate Bottle Mold	Amethyst-colored (Manganese Solarization)	1
	Lid Liner	Opaque White / Milk Glass	1
	Machine-Made Base	Amethyst-colored (Manganese Solarization)	1
		Colorless	3
	Machine-Made Bottle Glass	Amber	3
		Amethyst-colored (Manganese Solarization)	1
		Aqua	1
		Colorless	13
		Green	1
	Unid. Molded Technique	Amber	1
		Amethyst-colored (Manganese Solarization)	2
		Aqua	2
		Cobalt Blue	1
		Colorless	17
		Green	4
	Unidentified Glass shard(s) (Kitchen)	Amber	3
		Amethyst-colored (Manganese Solarization)	2
		Colorless	5
		Light Aqua	1
Glass Total			67
Metal	Miscellaneous Hardware	Barbed Wire fragment(s)	3
	Nail(s), Iron	Wire, Unidentified	1
	Storage Items	Iron Can(s)	5
	Unidentified Metal	Cast Iron	9
		Iron/Steel	10
Metal Total			28
Grand Total			**148**

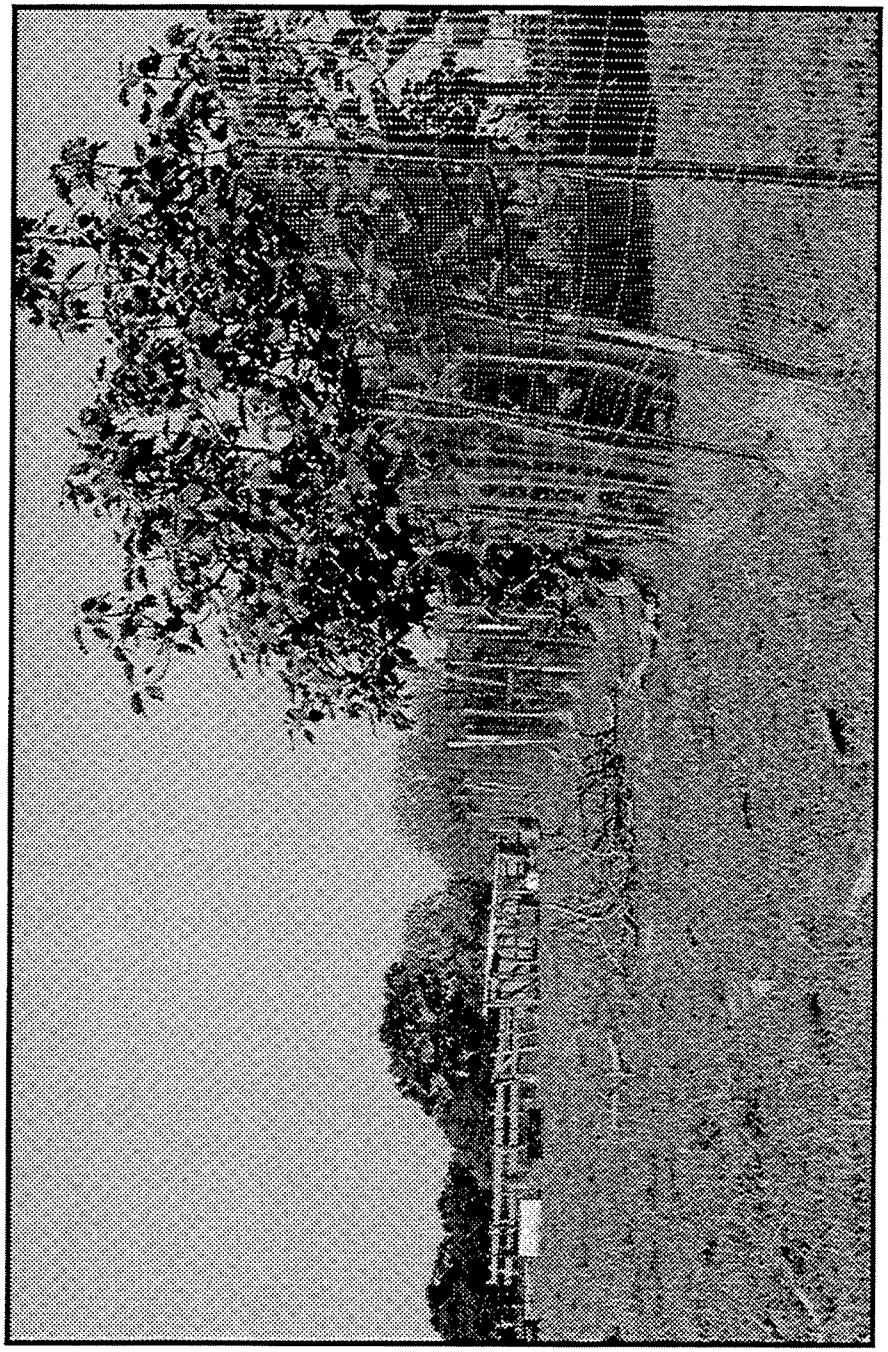


Figure 39. West View of Cultural Resource Locus 5-1.

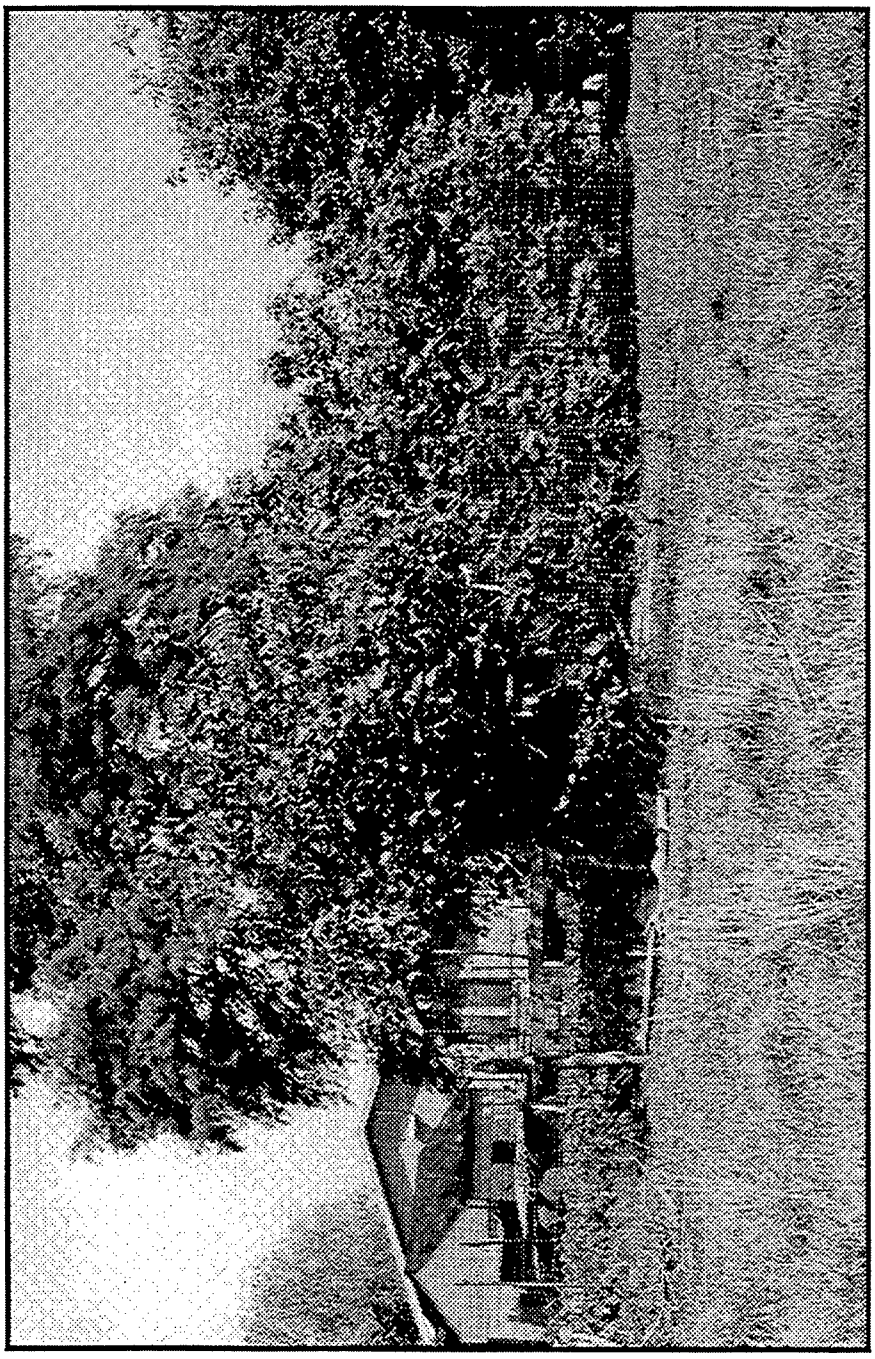


Figure 40. North View of Site 16LY94.

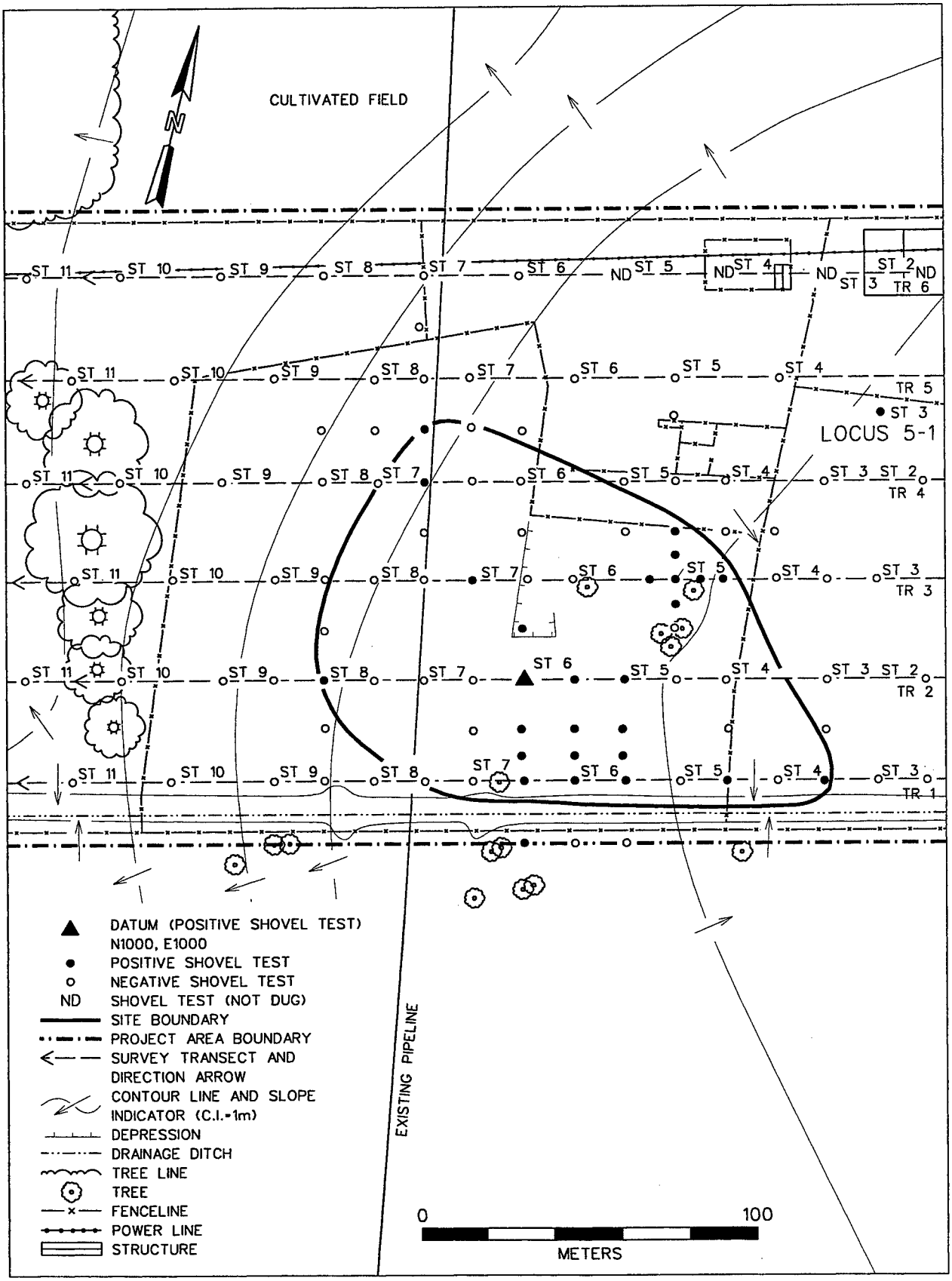


Figure 41. Plan View of Site 16LY94.

addition, 114 of the 120 artifacts originated from Shovel Test N970/E1000. The high concentration of artifacts within such a small area suggests that this portion of the site was formed by a single, isolated dumping episode. A concentrated surface scatter located to the north of this cluster of shovel tests also supports the theory that this area previously was used as a dump. A surface collection throughout the site area resulted in the recovery of 28 historic period artifacts. No subsurface cultural deposits were identified within the area of the surface collection.

A typical shovel test excavated at Site 16LY95 extended to a depth of 50 cmbs (19.7 inbs) and it exhibited two strata in profile (Figure 42). Stratum I, the plow zone, consisted of a layer of grayish brown (10YR 5/2) silty clay loam that extended from 0 to 25 cmbs (0 to 9.8 inbs). It was underlain by Stratum II, a dark grayish brown (10YR 4/2) silty clay that extended from 25 to 50 cmbs (9.8 to 19.7 inbs). All of the artifacts collected from Site 16LY95 originated either from the plow zone or from the surface.

Site 16LY95 consists of a nineteenth to twentieth century refuse disposal area. According to Ms. Bourque, these artifacts were associated with the dwellings that were reported to have been on the ridge overlooking Anselm Coulee (Bourque 1998, personal communication). The presence of scalloped edge whiteware and transfer-printed pearlware sherds indicate that the site dates from the early nineteenth century or later (Figures 47 - 50). This relatively small concentration of historic artifacts lacks integrity, and disturbance from plowing and erosion and the dearth of cultural material demonstrate that the cultural deposits identified at Site 16LY95 do not contain research potential. Site 16LY95 does not possess the qualities of significance as defined by the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]). No additional archeological testing of Site 16LY95 is recommended.

Site 16LY97 (Picard Cemetery)

Picard Cemetery dates from the mid-nineteenth to the twentieth century. The cemetery is located in the southwestern corner of the project area and it measures approximately 100 m(329 ft) in length x 50 m (164 ft) in width The site is depicted on the 1983 (and 1993 photorevised) USGS 7.5' Milton topographic quadrangle (Figure 3), and it is bounded on the east and south by an unimproved road. In addition, the cemetery is enclosed by barbed wire and chainlink fences. Although a magnetometer survey (see below) was conducted within a 15 m (49 ft) wide buffer zone along the northern and eastern sides of the cemetery to test for evidence of unmarked gurials outside the fenceline, the results of that survey were inconclusive. Site 16LY97 was assessed as not significant applying the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]) as cemeteries normally are not eligible for listing in the Register. Nonetheless, avoidance of Picard Cemetery and a 15 m (49 ft) buffer area on its north and east sides is recommended.

Results of the Magnetometer Survey in the Vicinity of Picard Cemetery

Analysis of the magnetometer survey data identified 15 dipolar anomalies located primarily in Area A (Figure 47). An examination of the contour maps demonstrated that the majority of these anomalies appeared to be metallic and located relatively close to the surface. The westernmost portion of the area situated north of Picard Cemetery (Areas A and C) contained disturbed, wet soil. These conditions resulted in somewhat erratic magnetometer readings (Figure 47). The barbed wire fences that surround the Picard Cemetery strongly influenced the readings taken within approximately 3 m (10 ft). The chainlink fencing produced distortions out to a distance of approximately 5 m (16.4 ft). The signal strength of the chainlink and the heavy barbed wire fences precluded any meaningful interpretation of the data collected within 5 m (16.4 ft) of these features. Other disturbances noted throughout the area included a line of trees that contained barbed wire fence remnants; these trees were located approximately 3 m (10 ft) north of the current fenceline. Finally, a small powerline crossed through the easternmost portion of the survey area. Minor disturbances included two extensive trash scatters located along the northern fenceline of the cemetery and at least one metal pole that had been broken off at ground level.

Subsurface Investigations of Magnetic Anomalies

Picard Cemetery was revisited in order to groundtruth the magnetic anomalies identified

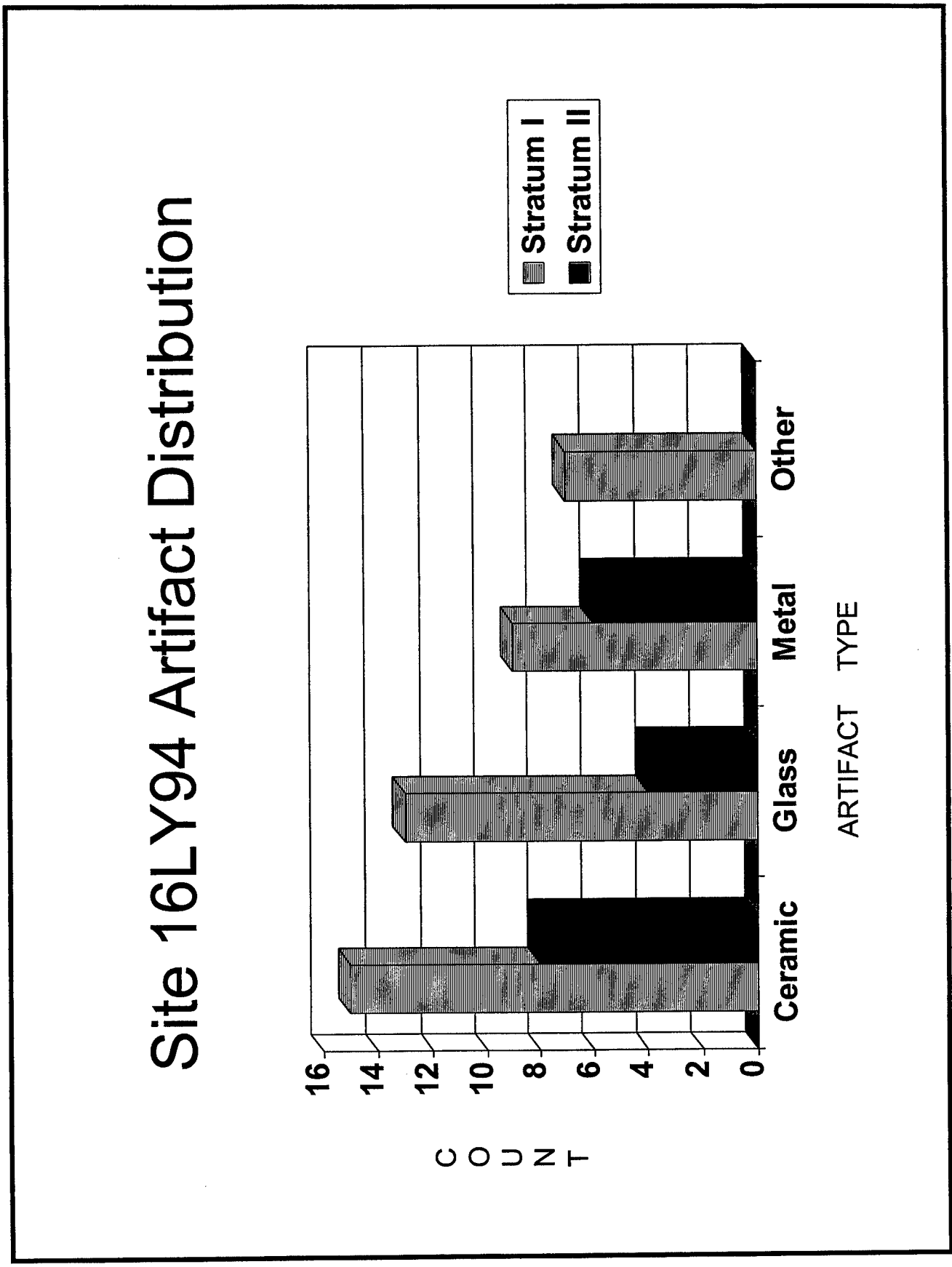


Figure 42. Site 16LY94 artifact distribution.

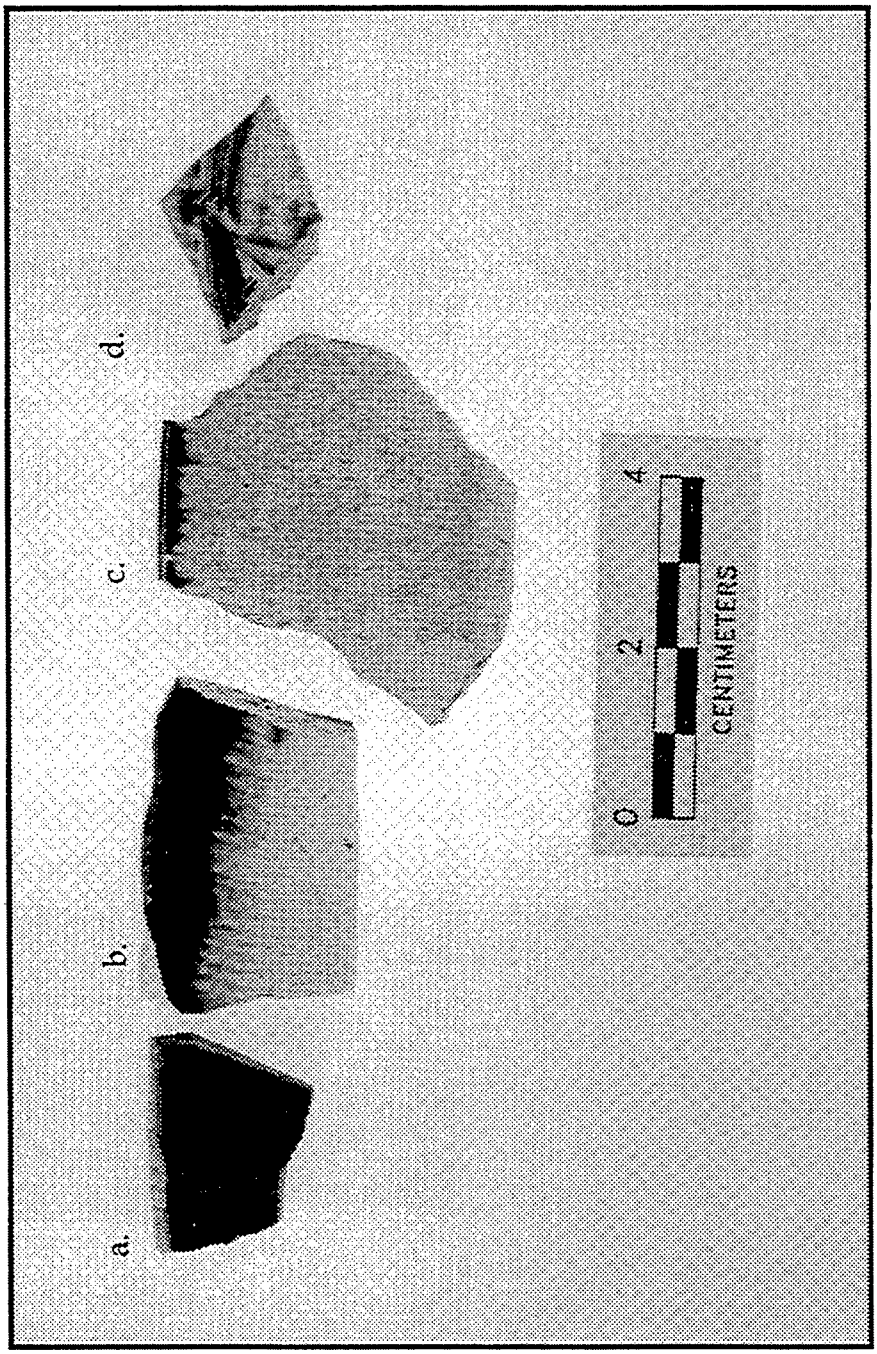


Figure 43. ***Selected ceramic sherds from Site 16LY94: a. Rouen Faience, tin-enameled earthenware rim sherd (FS# 25); b. whiteware sherd with scalloped, impressed blue shell-edge rim (FS# 10); c. whiteware sherd with unscalloped, unmolded, hand-painted blue shell-edge rim (FS# 10); d. yellowware sherd with blue-on-white sponged/spattered body.***

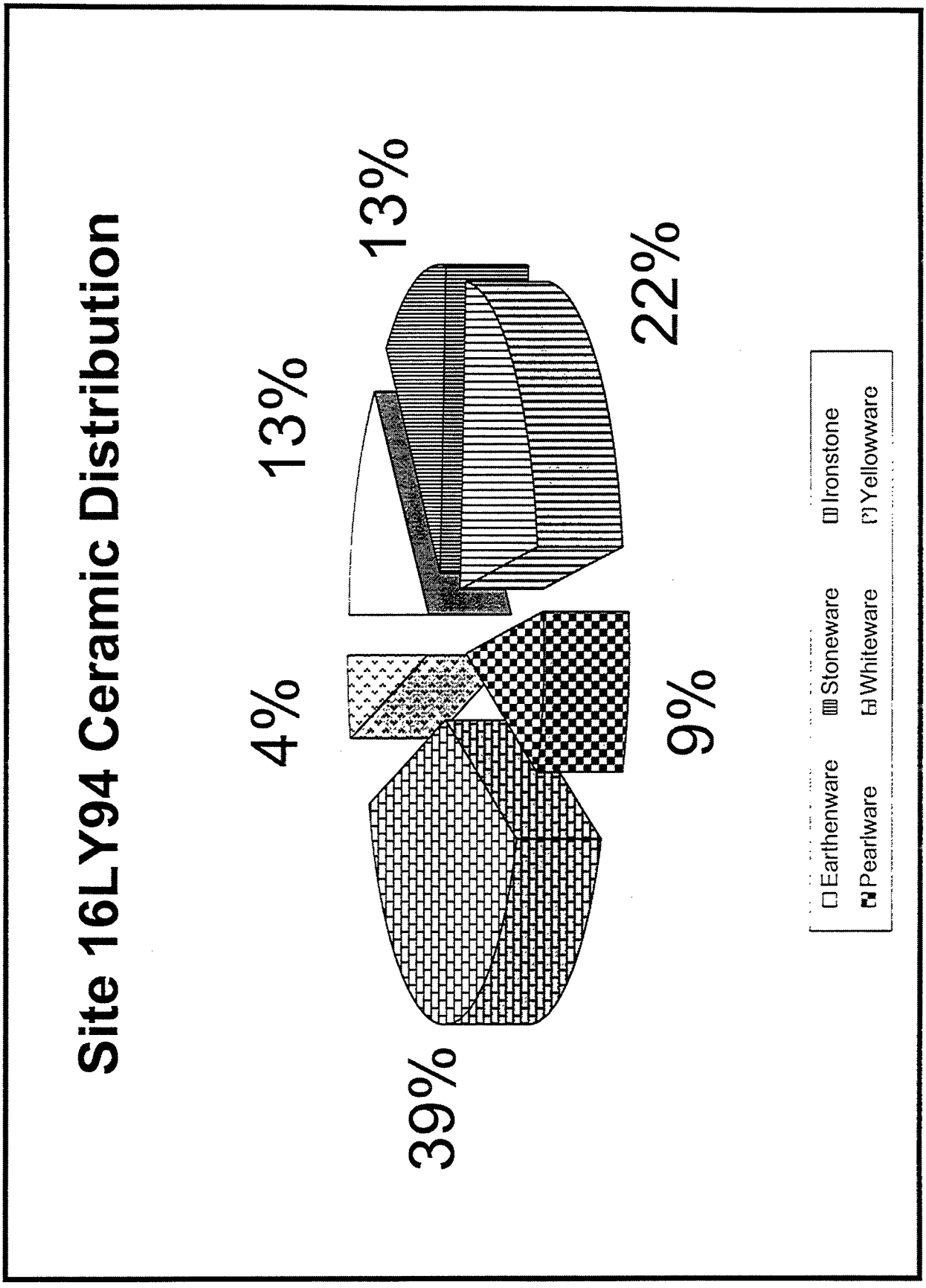


Figure 44. Site 16LY94 ceramic distribution.

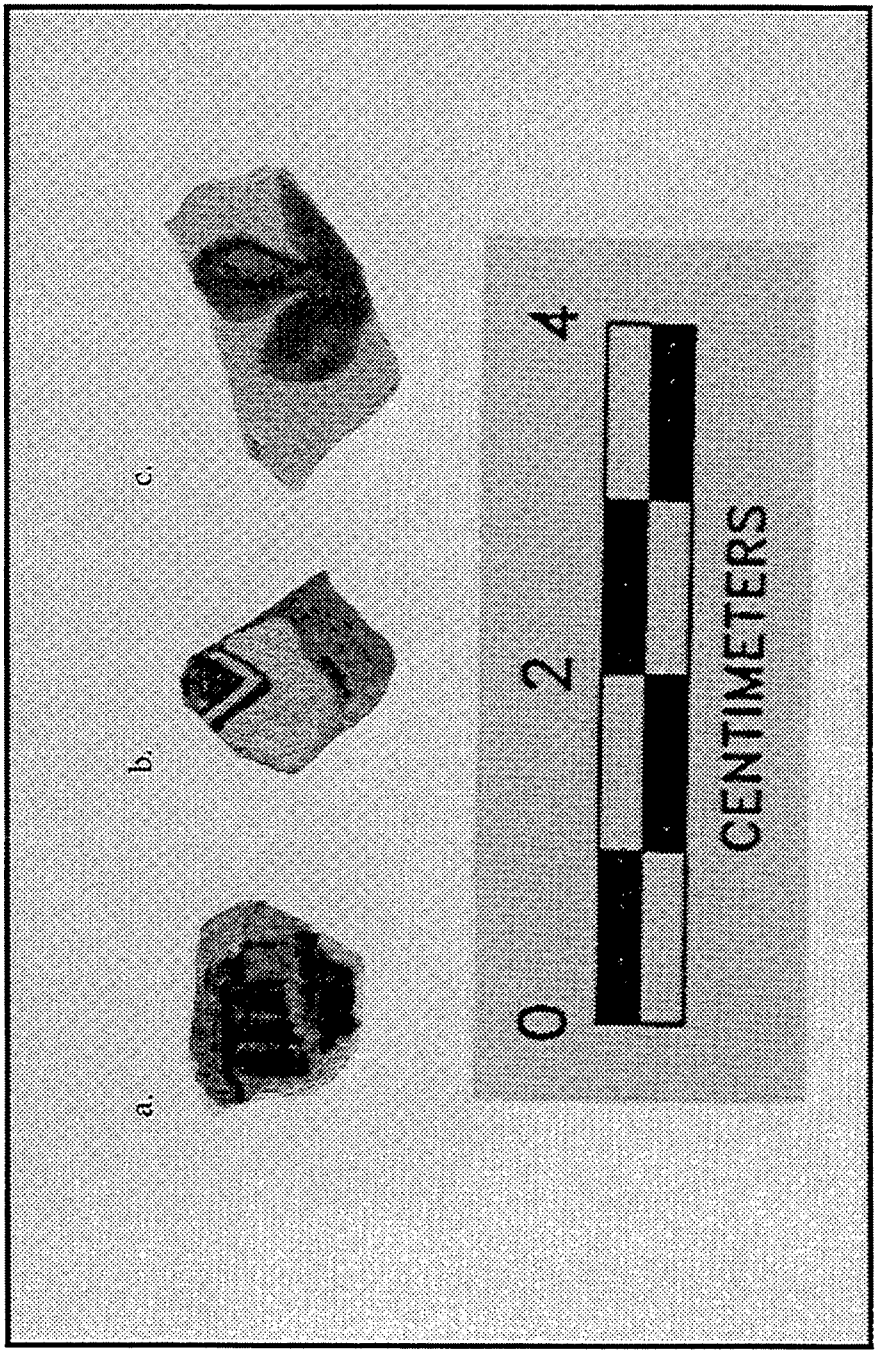


Figure 45. Selected ceramic sherds from Site 16LY94: a. pearlware sherd with Willow pattern transfer-printed decoration (FS# 15); b. ironstone sherd with transfer-printed body with red geometric pattern on the interior (FS# 15); c. whiteware sherd with underglazed hand-painted body with green foliate design (FS# 25).

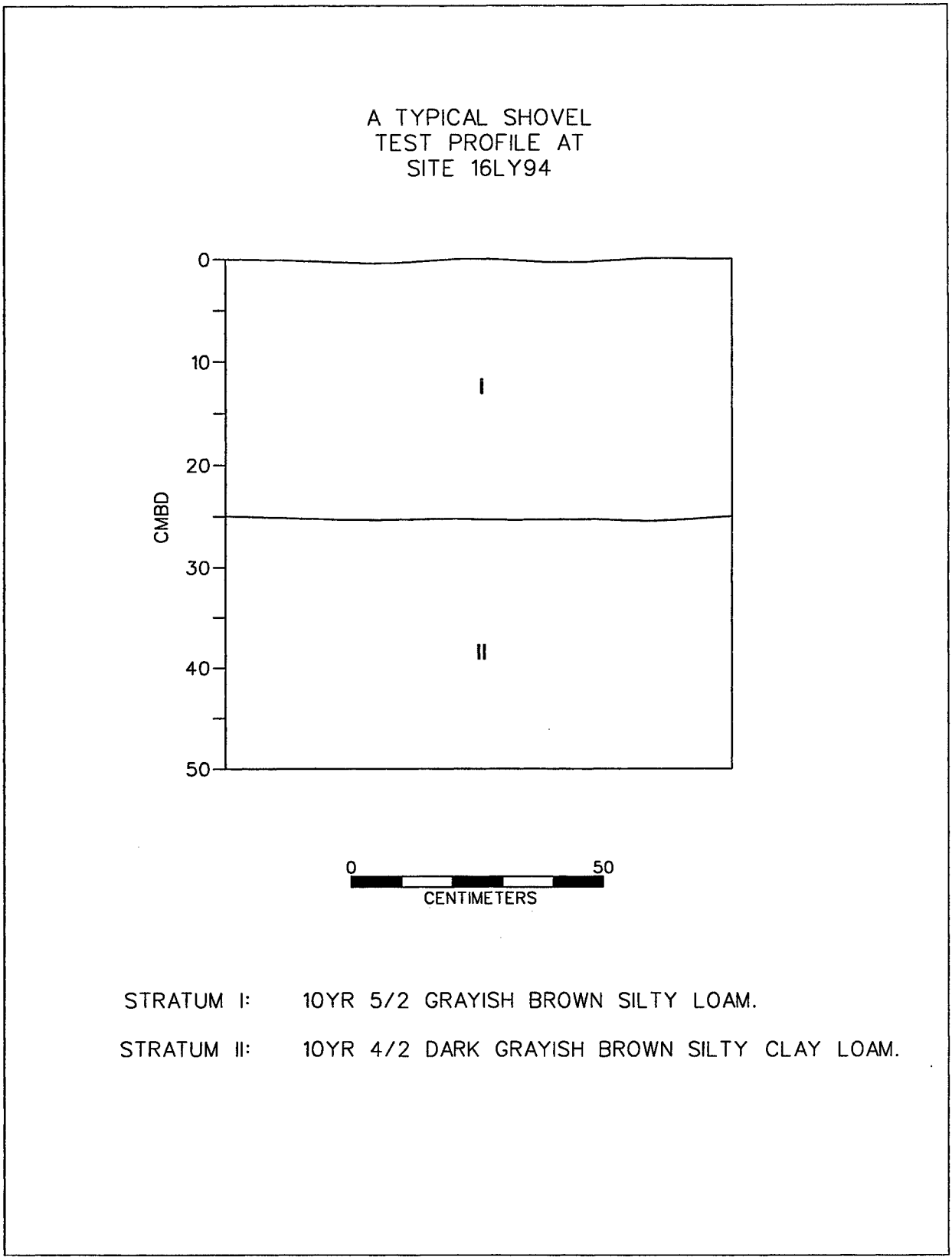


Figure 46. A typical shovel test profile at Site 16LY94.

Figure 47. East View of Site 16LY95.

during the magnetometer survey. Topographic anomalies such as small rises and depressions first were inspected using a thin steel probe. Probing identified a hard object(s) approximately 10 to 25 cm (4.0 to 9.8 in) below the ground surface in a small depression situated near the north cemetery fence. The object appeared to be 0.9 m (35 in) or more in diameter. Shovel Test 1 then was excavated in the center of the hard mass (Figure 47). Excavation revealed a brick rubble concentration. The shovel test was expanded to expose the horizontal boundaries of the feature and to identify its function. Once fully exposed, the feature was cleaned and inspected. The brick rubble was ovoid in shape and it measured 1.2 m x 1.0 m (3.9 ft x 3.3 ft) (Figures 48 and 49). Soil overlying the feature consisted of a brown (10YR 5/3) silty clay plow zone that contained minor inclusions of yellowish red (5YR 5/8) fine sandy silt and light brownish gray (10YR 6/2) silt. A total of seven shards of glass and four iron wire fragments were recovered from Stratum I (Table 8). The presence within this assemblage of a single shard of "Depression" glass suggests a twentieth century date for the overlying stratum.

Table 8. Historic Artifacts Recovered during Phase I Survey of Site 16LY97, Picard Cemetery.

CLASS	TYPE	SUBTYPE	TOTAL
Glass	"Depression" Glass	Colorless	1
	Machine-Made Bottle Glass	Colorless	6
Glass Total			7
Metal	Miscellaneous Hardware	Iron Wire (non-barbed Wire) fragment(s)	4
Metal Total			4
Grand Total			**11**

The brick fragments that comprised the feature were not aligned internally, yet the fragments along the outermost edges of the feature exhibited a preferred orientation. The observed orientation appeared consistent with haphazard deposition into a previously excavated pit. The feature was located close to the Vermilion River and near the oldest section of the cemetery. That area previously was determined to be the most probable location of the unmarked burials located outside of the current fence, so care was taken not to disturb the rubble since it might represent the remains of a tomb. The brick feature was drawn to scale, photographed, and reburied without further investigation. There were several factors, however, that suggested that the feature was not a tomb. These factors were: 1) no whole bricks were observed in the feature; 2) the brick fragments exhibited no internal alignment; 3) the size of the feature could only have accommodated an infant burial; 4) the brick fragments appeared to have been thrown haphazardly into a pit; 5) a large number of the brick tombs in the cemetery were decayed and obviously had been cleared of brick rubble (Figures 50 and 51); and 6) numerous pieces of brick rubble were noted along the edge of the Vermilion River where plastic flowers, vases, and other cemetery trash had been discarded (Figure 52). It is probable that Feature 1 resulted from the disposal of brick fragments originating from decaying tombs within the current cemetery fence.

A total of five auger tests were excavated in the 15 m (45 ft) buffer area north of the Picard Cemetery (Figure 47). Only those magnetic anomalies that appeared large enough to represent the remains of a tomb were auger tested. These locations consisted of anomalies 2, 3, 4, and 10. Anomaly 1 also was tested despite being of moderate strength because it fell near Feature 1 outside of the oldest portion of the cemetery. During survey, three of the five planned auger tests were excavated successfully. These were positioned at magnetic anomalies 1, 2, and 10. Auger tests could not be excavated at anomalies 3 and 4 due to the presence of a heavy root zone near the ground surface. Two auger tests were placed judgmentally between magnetic anomalies 4 and 10 as a check against the other auger test excavation results. In the auger tests excavated at anomalies 1 and 2, small bits of brick were noted in Stratum I. The stratum extended from 0 to 65 cmbs (0 to 25.6 inbs) and it consisted of grayish brown (10YR 5/2) silty clay loam (Figure 53). No additional cultural material and no cultural features were identified in the remaining auger tests.

Magnetometer survey and subsequent field testing of the results did not provide conclusive evidence of the absence or presence of un-marked

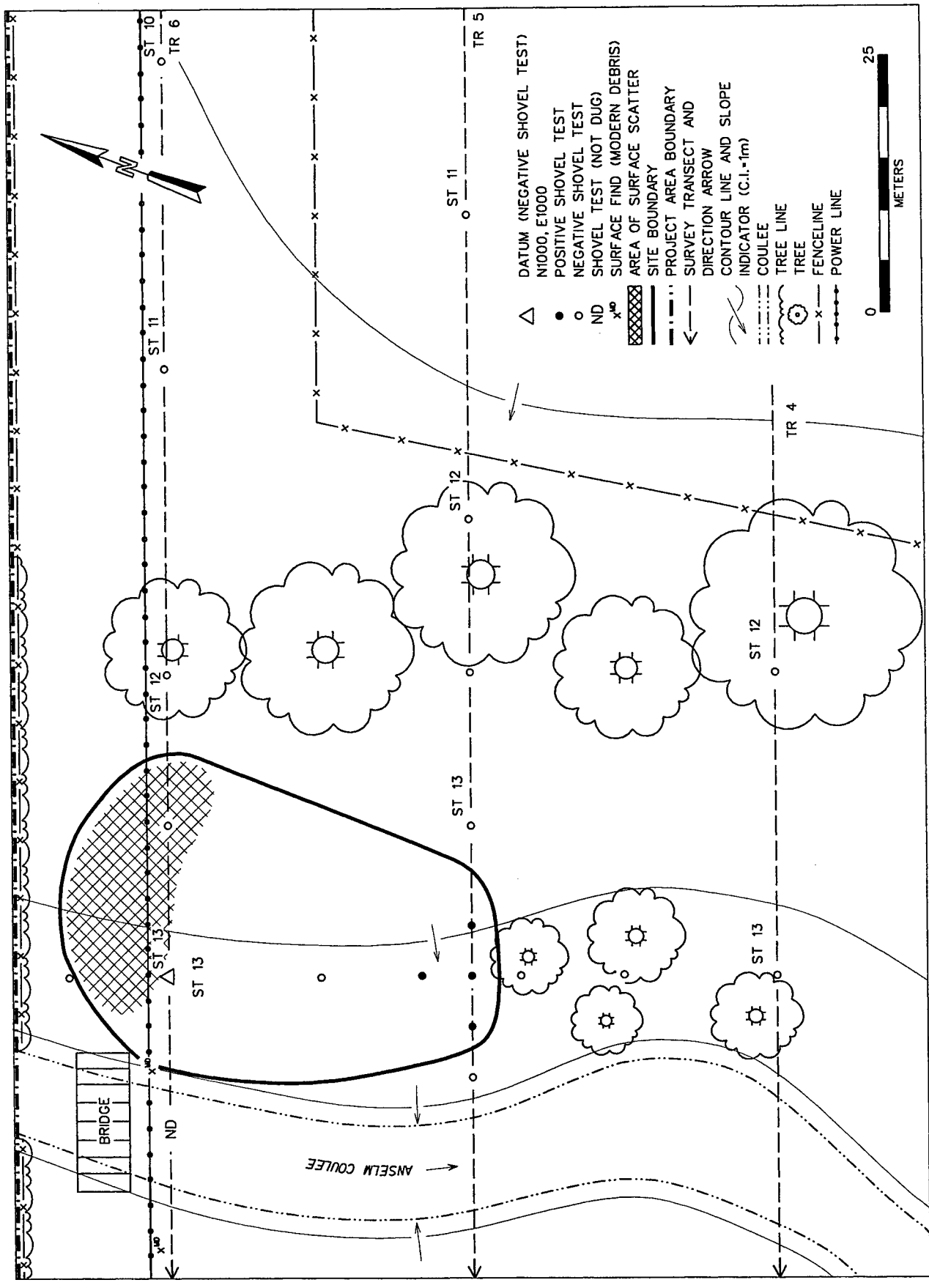


Figure 48. Plan View of Site 16LY95.

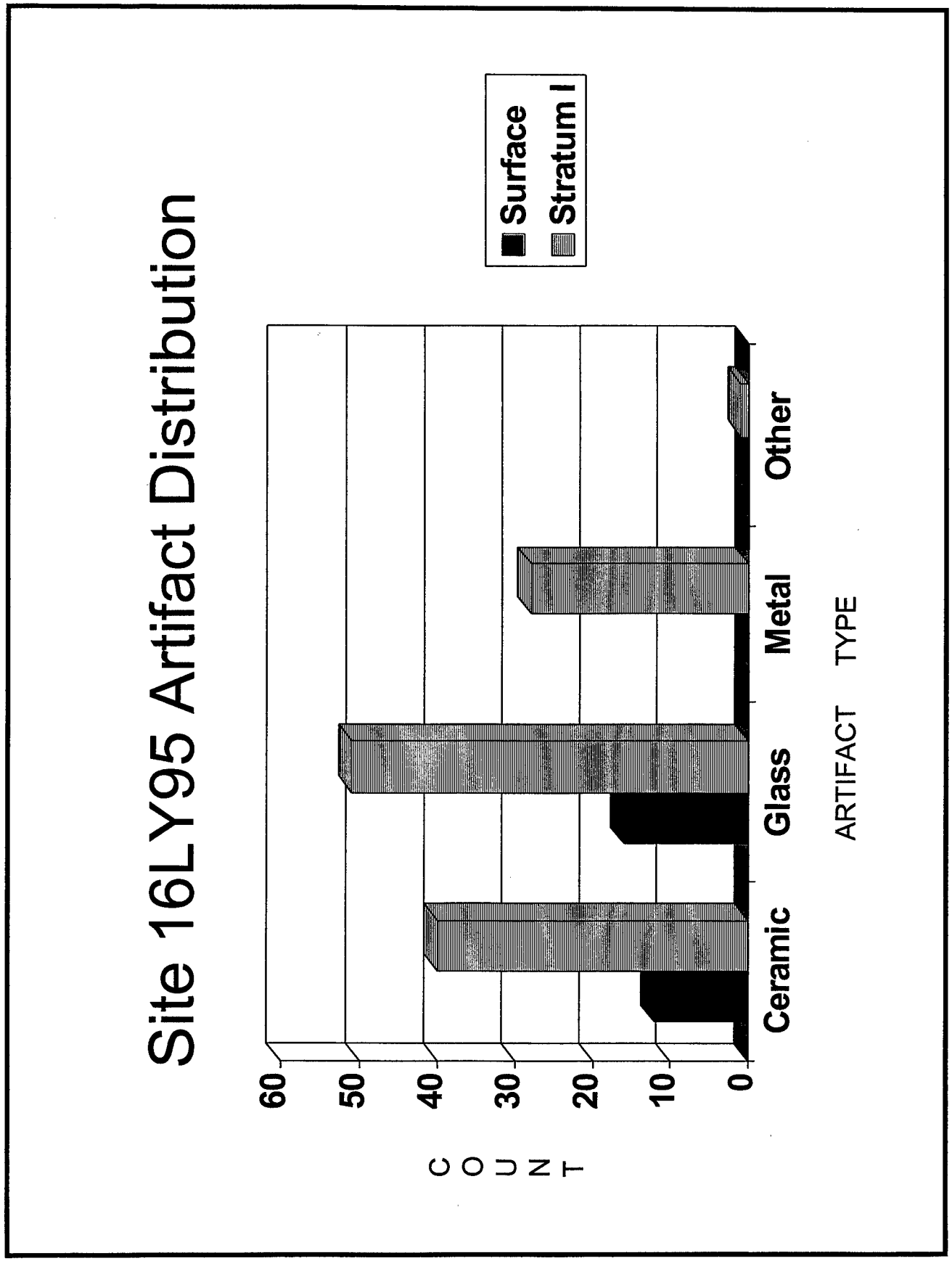


Figure 49. Site 16LY95 artifact distribution.

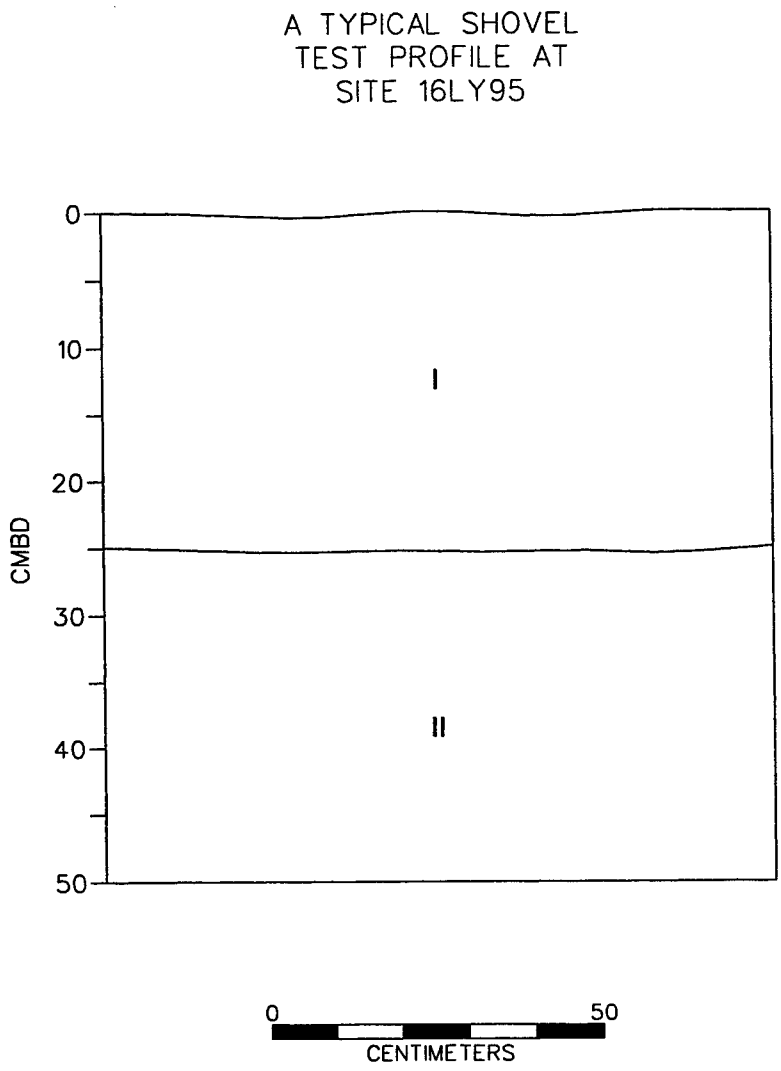


Figure 50. A typical shovel test profile at Site 16LY95.

Figure 51. ***West view of damaged tomb.***

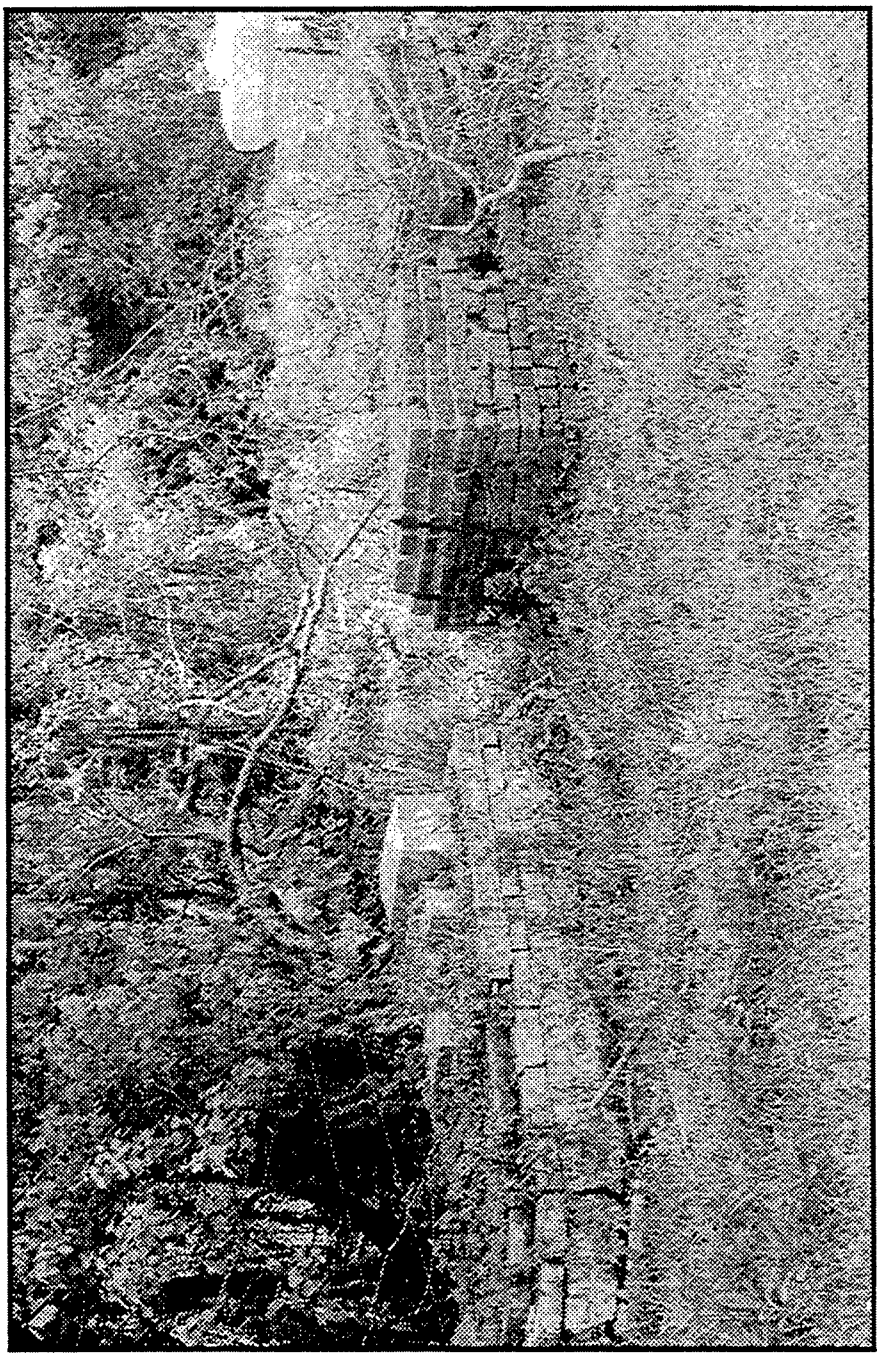


Figure 52. West view of damaged tombs in the southwest corner of Picard Cemetery.

Figure 53. East view of brick rubble from tombs outside of the west cemetery fence.

graves. The poor results can be attributed in part to the wet soil conditions and the magnetic disturbances (e.g., the chain link fencing) found throughout the area. A remnant fenceline also was located along the northern portion of the project area, but outside of the modern boundaries of the cemetery. This remnant fenceline reinforces anecdotal information provided by the current property owner that suggested that the current northern fenceline of the cemetery may not be the original cemetery boundary (Bourque 1998, personal communication). Based on the uncertainty of the magnetometer survey and on the informant testimony, the entire 15 m (49 ft) buffer zone should be avoided during the proposed dredged material disposal activities.

Picard Cemetery Study

In addition to the magnetometer survey, R. Christopher Goodwin & Associates, Inc., used the information from the tombstone inscriptions to examine trends related to mortality in the area. Variables used in this study consisted of age at death, century of death (nineteenth or twentieth), and sex of individual (Table 9). This information may not be representative of the entire population of the Picard Cemetery since most of the graves were unmarked or contained markers without inscriptions. This was especially true of infant burials.

For the purposes of the mortality analysis, sexes were assigned based on common regional first names; those tombstone inscriptions bearing only initials were excluded from study. In addition, only post-pubescent individuals (based on age of death) were included in this analysis. Age at death was combined with date of birth to assign a primary life century (nineteenth or twentieth) where the median date between birth and death determined the century. Groups were analyzed by sex and century to attempt to discern any significant (at the .05 level) trends (nineteenth century female n=4, nineteenth century male n=12, twentieth century female n=29, and twentieth century male n=39). All groups were tested for normal distributions and an F-test was performed between those with sufficient sample sizes and nearly normal distributions to verify variance assumptions. Finally, nearly normal groups with equal variances were tested for equal population means with a standard T-test. Non-normal groups were tested with a Wilcoxon-Mann-Whitney test.

Overall, there was no significant difference between the male and female groups, although females lived approximately 8 years longer than males on average (Table 10). When these data were broken down into nineteenth versus twentieth century figures, females and males appear to have substantially different average lifespans. In the nineteenth century, females lived an average of 56 years while males lived 68 years. Conversely, in the twentieth century, females lived to an average age of 68, and males only lived to an average age of 55. It should be noted, however, that the difference in the nineteenth century lifespans is not statistically significant, although the latter comparison is. The only other significant trend apparent was the approximately 13-year difference in average lifespan between the nineteenth and twentieth century male groups. A cursory examination of the date of death for the male groups did not yield any significant trends (e.g., wartime fatalities). Presumably, some of the apparent inconsistencies in this data can be explained by the relatively small sample size and ongoing usage of the Picard Cemetery.

Table 9. Burials in the Picard Cemetery, Milton, La. (information compiled by Lafayette Genealogical Society members David Landry and James Bourque)

NAME	DATE OF BIRTH	DATE OF DEATH	AGE AT DEATH	ROW	TOMB	ADDITIONAL INFORMATION
Baudoin, Delta				2	4	
Baudoin, Emeil		1917	79	2	5	
Baudoin, Gladu	Oct. 7, 1910	Dec. 1915	5	1	7	Baby Tomb
Bodoin, Julie	Oct. 1888	Feb. 8, 1907	18	9	10	Mrs. John Denais
Boudreaux, Bernadette				13	11	Concrete tomb, fenced area
Boudreaux, Caroline		Apr. 12, 1917	87	11	6	Largest tomb in cemetery
Boudreaux, Colastie				13	11	Concrete tomb, fenced area
Boudreaux, Jeanne				13	11	Concrete tomb, fenced area

Table 9, continued

NAME	DATE OF BIRTH	DATE OF DEATH	AGE AT DEATH	ROW	TOMB	ADDITIONAL INFORMATION
Boudreaux, Joseph				13	11	Concrete tomb, fenced area
Boudreaux, Laodis		Sept. 1, 1948	62	5	2	
Bourque, Azelima				14	11	
Bourque, Twins				14	6	Baby graves, concrete
Breaux, Cleatis	Apr. 19, 1916	Sept. 17, 1917	1	3	1	Baby, concrete cross
Brevos, Walter Jr.	Mar. 4, 1929	Sept. 16, 1987	58	G-3	9	
Broussard				14	4	Iron cross
Broussard				15	3	Concrete tomb
Broussard, Adam		Sept. 3, 1901		9	3	Concrete tomb, iron cross
Broussard, Aurley				14	1	
Broussard, Beulah P.	Dec. 15, 1916	Sept. 6, 1979	62	G-1	5	
Broussard, Ecomel T.	Nov. 9, 1907	Jul. 14, 1924	17	10	21	Concrete tomb
Broussard, Elima				12	12	
Broussard, Ellis		1988	71	12	9	
Broussard, Eloi		1955		15	1	Concrete tomb
Broussard, Hortense Prejean	Dec. 1, 1913	Jan. 11, 1988	74	14	2	
Broussard, Laura	Feb. 15, 1888	Aug. 7, 1967	79	2	2	Inside wire fence
Broussard, Leon T.		Jan. 1937	53	6	9	
Broussard, Maurice	Sept. 17, 1900	Jul. 29, 1925	24	10	21	Concrete tomb
Broussard, Octave				15	2	Concrete tomb
Broussard, Olivia		1920		15	1	Concrete tomb
Broussard, Oreli				12	12	
Broussard, Remus		1937	46	8	7	
Bruno, Leona P.	Jul. 27, 1941	Sept. 19, 1986	45	G-3	18	
Campell, Charles				1	3	Pipe around concrete tomb
Citter, Ada		1977	92	18	2	
Clositio, Edia C.	Apr.20, 1895	Feb. 14, 1948	52	1	2	Little Flower House
Clositio, Ophelias	Dec. 13, 1895	Feb. 17, 1982	86	1	2	Little Flower House
Cloteaux, Frank		1914	36	9	12	Concrete tomb, iron cross
Cloteaux, Leopold		1976	68	9	12	Concrete tomb, iron cross
Cloteaux, Murphy J.	Feb. 19, 1930	Dec. 29, 1989	59	3	5	Concrete tomb
Clotiaux, Eveline	May 5, 1900	Aug. 31, 1931	31	3	7	Concrete tomb
Clotiaux, Mathilde	Sept. 24, 1898	Jun. 17, 1924	25	3	7	Concrete tomb
Clotiaux, Robert	Jul. 24, 1875	Dec. 29, 1989	114*	3	6	Concrete tomb
Clotiaux, Roy	Oct. 21, 1903	Aug. 21, 1977	73	3	7	Concrete tomb
Colla, Nella Marie	Feb. 6, 1898	Jan. 28, 1970	71	16	6	
Cormier, Dennis	Apr. 21, 1913	Mar. 15, 1915	2	15	20	
Cormier, Emily B.	Aug. 8, 1920	Jan. 22, 1982	61	15	20	
Dauphine, Garfield		Oct. 30, 1968		17	16	
Denais, Adam	Apr. 27, 1890	Nov. 19, 1926	36	9	10	Concrete tomb
Denais, John	Jul. 27, 1885	Aug. 2, 1922	36	9	10	Concrete tomb
Deonois, Sebastion	1840	1927	87	9	6	Brick tomb with concrete cross
Desormeaux, Elizabeth	Jan. 24, 1878	Sept. 7, 1947	69	3	6	Concrete tomb
Desormeaux, Francis	Jul. 14, 1926	Dec. 5, 1937	11	1	6	
Duhon, Firman	Mar. 21, 1859	Aug. 22, 1927	68	14	13	
Duhon, Joseph Ursin	Mar. 25, 1860	Aug. 6, 1823*		11	11	Listed as oldest date on tomb by the Lafayette Geneological Society however, year of death is incorrect (may be 1923)
Elizar, Willis		May 12, 1949		17	16	
Gilbert, Joe		Apr. 21, 1958	78	G-3	22	
Gilbert, Ovilla	1907	1985	78	14	20	
Gilbert, Victoria		Apr. 11, 1960	83	G-3	21	
Goodie, Dennis M.	Mar. 24, 1917	14-May-85	68	G-3	8	
Graves, Clarence	Jul. 9, 1913	Mar. 18, 1983	69	G-3	1	
Green, Nelson Sr.	Jul. 8, 1917	Aug. 13, 1990	73	G-3	25	Nickname "Nom Bee"
Guidry, Anita	Oct. 22, 1900	Jan. 3, 1976	75	G-3	3	
Guidry, Roy		Jun. 15, 1900		G-3	2	
Hebert, Andre	1848	1928	80	11	8	Veteran of Confederate War

Table 9, continued

NAME	DATE OF BIRTH	DATE OF DEATH	AGE AT DEATH	ROW	TOMB	ADDITIONAL INFORMATION
Hebert, Andrew	1844	1926	82	11	8	Veteran of Confederate War
Hebert, Arness				15	19	Hebert tomb
Hebert, Cecelie B.				15	19	Hebert tomb
Hebert, Honorine Miss	Feb. 27, 1877	Jul. 1942	65	8	5	
Hebert, John B.				13	9	Concrete tomb
Hebert, John B., Mrs.				13	9	Concrete tomb
Hebert, Louis	Apr. 26, 1877	Jul. 3, 1928	51	8	2	
Hebert, Nadren				15	19	Hebert tomb
Hebert, Narcisse				15	19	Hebert tomb
Hebert, Theodule	Jan. 25, 1903	Feb. 21, 1963	60	G-2	5	
Hebert, Victor				15	19	Hebert tomb
Hebert, Victoria				15	19	Hebert tomb
Hulin, Dulias	Oct. 30, 1886	Nov. 7, 1952	65	10	2	Concrete tomb
Johnson, Ernent	1919	1981	62	15	15	
Landry, Feloman	Aug. 24, 1856	Aug. 8, 1910	53	2	6	
Landry, John Agnut	Aug. 15, 1920			1	17	
LeBlanc, Euphemie	1828	May 27, 1909	81	10	8	Mrs. Emile Broussard
Lee, Adrienne A.				18	14	
Lee, Edmond	Nov. 10,1914	Oct. 10, 1982	67	17	21	Army-World War II
Louis, Roaul John	1880	1919	39	16	2	
McClinton, J.W. Jr.	Mar. 18, 1918	Dec. 29, 1974	56	G-2	4	
Meaux, Fernes	Oct. 29, 1870	Jan. 30, 1923	53	10	20	Brick tomb with iron cross
Mouton, Adrien	1907	1968	61	15	17	Concrete cross at fence
Mouton, Adrien	1902	1968	66	16	21	Fenced area
Mouten, Aurelian	1902	1953	51	16	21	Fenced area
Mouton, Eva G.	1855	1949	94	16	21	Fenced area
Mouton, Joseph Jr.	Sept. 30, 1959	May 14, 1983	23	G-2	2	Marine Corps; son of Edna Mouton
Mouton, Louis	1867	1945	78	16	21	Fenced area
Mouton, O.				13	2	Brick tomb with concrete cross
Mouton, Ursin				13	3	Brick tomb
Mouton, Ursin Mrs.				12	4	Concrete cross
Picard, Adalph	1854	1944	90	12	13	
Picard, August	Jul. 27, 1891	Jun. 4, 1943	51	7	4	
Picard, Celiman	Mar. 14, 1861			11	6	Child of Auguste P. Picard
Picard, Eugene	1850			11	6	Son of August P.Picard
Picard, Francoise Eleonare Philippine June		Jul. 4, 1865				
Picard, George	Jan. 17, 1917	Mar. 20, 1983	66	G-1	4	Army-World War II
Picard, Pierre August	1820	Aug. 6, 1880	60	11	6	Donor of Picard Cemetery
Picard, Theresa B.	Feb. 17, 1891	Apr. 8,1991	100	7	4	Grass triangle between row 12 and 13
Pierre, Edmonia G. Mrs.	1875	1965	90	14	19	
Primeaux, A.V.	1874	1926	52	4	1	
Primeaux, Ores	1912	1924	12	4	3	
Primeaux, Valerian				4	4	Louisiana Infantry
Provis, James Simon	Oct. 6, 1926	Feb. 16, 1980	53	G-1	7	Double tomb in fence
Provost, Alex	Jan. 10, 1918	Jul. 19, 1993	65	G-2	6	
Provost, Alzina	1892	1975	83	G-3	20	
Provost, Camille Sr.	Sept. 19, 1911	Apr. 8, 1979	68	G-2	7	
Provost, Cornelius	Jun. 30, 1916	Apr. 6, 1959	42	G-3	15	
Provost, Mary E.	Sept. 9, 1920	Sept. 25, 1982	62	G-3	5	
Provost, Mary F.	Dec. 8, 1915	Jan. 11, 1986	70	G-3	15	
Provost, Oliver J.	1889	1958	69	G-3	23	Together with 20
Provost, Warren	Dec. 1, 1938	Feb. 16, 1957	19	G-3	19	
Richard, Listi Mrs.				8	1	
Romero, Andrew				1	18	
Roy, Sevin	1843	Feb. 29, 1928	85	7	1	
Sellers				14	5	Small tomb, iron cross
Simon, Anita	1918	1976	58	17	13	

Table 9, continued

NAME	DATE OF BIRTH	DATE OF DEATH	AGE AT DEATH	ROW	TOMB	ADDITIONAL INFORMATION
Simon, Elize	1890	1949		17	4	Iron cross
Simon, Jean				10	12	Concrete tomb, concrete and iron cross
Simon, John Jr.	1935	1977	42	17	12	
Simon, Theodule Mrs.				14	16	
Stevens, Eristile	Jul. 19,1911	Jan. 8, 1913	2	15	7	Concrete tomb
Theall, A. Mrs.				11	16	
Thibeaux, Louis Edward	Apr. 23, 1981	Jul. 22, 1981		1	11	Concrete tomb
Thibodeaux, Palmire				12	12	
Thomas, Joseph Le?	Jul. 3, 1925	Sept. 30, 1947	22	15	7	Concrete tomb
Tolivar, Jean Provost	Oct. 12, 1949	Apr. 19, 1988	38	G-3	17	
Touche	Jun. 1, 1911	Jan. 8, 1989	77	1	12	Concrete tomb
Touche, Theotise S.	Mar. 28, 1904	Oct. 5, 1967	63	1	13	Concrete tomb
Toups, Elia	Aug. 14, 1905	Mar. 16, 1955	49	G-2	8	
Trahan, Alphe	1883	1939	56	14	12	
Trahan, Alvin L.				16	20	Baby; iron cross; fenced
Trahan, Angeline	Jun. 15, 1889	Jul. 18, 1933	44	10	2	Concrete tomb
Trahan, Angelique	Jun. 1889			10	4	Concrete tomb with concrete cross
Trahan, Edna Mouton	Aug. 9, 1905	Jul. 2, 1982	76	G-2	1	
Trahan, Edvard	Aug. 12, 1896	Apr. 2, 1982	86	G-3	11	Army veteran
Trahan, Felicia		Jan. 11, 1942		17	10	
Trahan, Joseph		1928		11	3	Iron cross
Trahan, Terry Lee	Jul. 1, 1958	Jul. 18, 1980	22	G-3	10	
Trahan, Theogine	1878	1914	36	3	4	Concrete tomb with iron cross
Vallene, Alice Allen	1862	1952	90	17	15	
Villery, Candice Marie		Aug. 31, 1991		G-3	4	Baby tomb
Vincent, Alzire				14	14	
Vincent, Theogine Mrs.				14	15	
Wilson, Melvin		Jan. 11, 1949		11	17	End row 11
Unmarked				G-1	1	Concrete tomb
Unmarked				G-1	2	Concrete tomb
Unmarked				G-1	3	Concrete tomb
Unmarked				G-2	3	Concrete tomb
Unmarked				G-2	6	Concrete tomb
Unmarked				G-2	12	Concrete tomb
Unmarked				G-3	13	Concrete tomb
Unmarked				G-3	14	Concrete tomb
Unmarked				G-3	24	
Unmarked				1	4	Brick tomb
Unmarked				1	5	Iron and concrete cross
Unmarked				1	10	Concrete tomb
Unmarked				1	14	
Unmarked				1	15	
Unmarked				1	16	
Unmarked				2	1	Concrete tomb
Unmarked				2	3	Concrete-wire fence
Unmarked				3	3	Concrete tomb; iron cross
Unmarked				3	0	Concrete tomb; iron cross
Unmarked				3	9	Concrete tomb; two iron crosses
Unmarked				4	2	Brick tomb; concrete cross
Unmarked				4	5	Brick tomb; iron cross
Unmarked				4	7	Twin baby graves
Unmarked				4	8	Brick tomb; concrete cross
Unmarked				5	1	Concrete double (tomb?); two iron crosses
Unmarked				6	1	Brick tomb
Unmarked				6	2	Brick tomb
Unmarked				6	3	Brick tomb
Unmarked				6	7	Brick tomb

Table 9, continued

NAME	DATE OF BIRTH	DATE OF DEATH	AGE AT DEATH	ROW	TOMB	ADDITIONAL INFORMATION
Unmarked				6	8	Brick tomb; iron cross
Unmarked				6	10	Brick tomb
Unmarked				7	3	Brick tomb; iron cross
Unmarked				8	3	Concrete cross
Unmarked				8	9	Iron cross
Unmarked				9	2	Brick tomb; three iron crosses
Unmarked				9	4	Brick tomb; iron cross
Unmarked				9	5	Grass tomb; iron cross
Unmarked				9	7	Grass tomb; iron cross
Unmarked				9	9	Baby; brick with iron cross
Unmarked				9	11	Grass-Cinder block; iron cross
Unmarked				9	13	Brick tomb; iron cross
Unmarked				9	14	Concrete; concrete cross
Unmarked				9	15	Concrete; iron cross
Unmarked				9	16	Concrete; iron cross
Unmarked				10	1	Concrete tomb; concrete cross
Unmarked				10	3	Concrete tomb; iron and concrete cross
Unmarked				10	5	Brick tomb
Unmarked				10	6	Iron cross
Unmarked				10	7	Iron cross
Unmarked				10	9	Brick tomb
Unmarked				10	10	Baby; concrete tomb; iron cross
Unmarked				10	11	Concrete tomb; two iron crosses
Unmarked				10	14	Brick tomb; iron cross
Unmarked				10	15	Brick tomb
Unmarked				10	16	Brick tomb
Unmarked				10	17	Brick tomb
Unmarked				10	18	Brick tomb
Unmarked				10	19	Brick tomb; iron cross
Unmarked				11	1	
Unmarked				11	4	Brick tomb
Unmarked				11	5	Brick tomb
Unmarked				11	9	Brick on dirt tomb
Unmarked				11	10	Brick tomb iron cross
Unmarked				11	12	Brick tomb
Unmarked				11	13	Brick; next to wire fence
Unmarked				11	14	Two iron crosses inside fence
Unmarked				12	1	Brick tomb; iron cross
Unmarked				12	2	Concrete tomb with two crossses
Unmarked				12	5	Concrete tomb
Unmarked				12	6	Brick tomb
Unmarked				12	7	Concrete cross
Unmarked				12	8	Concrete tomb; iron cross
Unmarked				12	11	Brick tomb; small
Unmarked				12	14	Two graves; two crosses
Unmarked				12	15	Iron cross
Unmarked				12	16	Iron cross
Unmarked				12	17	Iron cross
Unmarked				13	1	Brick tomb
Unmarked				13	5	Brick tomb
Unmarked				13	6	Brick tomb; iron cross
Unmarked				13	7	Baby; concrete
Unmarked				13	12	Baby; concrete tomb; concrete cross
Unmarked				13	13	Brick tomb; iron cross
Unmarked				13	14	Baby; brick tomb; iron cross
Unmarked				13	16	Brick tomb; iron cross
Unmarked				13	17	Concrete tomb; iron cross
Unmarked				13	18	Brick tomb; concrete cross

Table 9, continued

NAME	DATE OF BIRTH	DATE OF DEATH	AGE AT DEATH	ROW	TOMB	ADDITIONAL INFORMATION
Unmarked				14	3	Baby girl; concrete tomb
Unmarked				14	7	Brick tomb; concrete cross
Unmarked				14	8	Brick tomb; concrete cross
Unmarked				14	18	Concrete cross
Unmarked				14	22	Brick tomb; two iron crosses
Unmarked				14	23	Brick tomb
Unmarked				14	24	Brick tomb; next to fence
Unmarked				15	4	Concrete tomb; concrete cross
Unmarked				15	5	Concrete tomb; concrete cross
Unmarked				15	8	Baby; concrete tomb
Unmarked				15	9	Baby; brick tomb
Unmarked				15	10	Concrete tomb; iron cross
Unmarked				15	13	Concrete tomb; concrete cross
Unmarked				15	14	Concrete tomb; concrete cross
Unmarked				15	16	Concrete cross at fence
Unmarked				15	18	Concrete cross at fence
Unmarked				15	22	Concrete tomb; iron cross
Unmarked				15	23	Concrete tomb; iron cross
Unmarked				15	24	Brick border; three iron crosses
Unmarked				16	1	Baby; two iron crosses
Unmarked				16	3	Baby; one iron cross
Unmarked				16	4	Baby
Unmarked				16	5	Baby
Unmarked				16	7	Concrete cross
Unmarked				16	8	Concrete cross
Unmarked				16	9	Concrete and iron cross
Unmarked				16	12	Concrete tomb
Unmarked				16	13	Iron cross
Unmarked				16	15	Brick tomb; iron cross
Unmarked				16	16	Baby; at foot of fifteen
Unmarked				16	17	Two concrete crosses
Unmarked				16	18	One concrete cross and one iron cross
Unmarked				16	19	Baby; iron cross; fenced
Unmarked				16	22	Iron cross; fenced
Unmarked				16	23	Baby; two crosses fenced
Unmarked				16	25	Iron crosses
Unmarked				16	26	Iron cross; fenced
Unmarked				17	1	
Unmarked				17	2	Concrete cross
Unmarked				17	3	Concrete cross
Unmarked				17	4	Iron cross
Unmarked				17	6	Concrete cross
Unmarked				17	7	Concrete cross
Unmarked				17	8	Concrete cross
Unmarked				17	9	Iron cross
Unmarked				17	17	Concrete tomb; concrete cross
Unmarked				17	18	Concrete tomb and cross
Unmarked				17	19	
Unmarked				17	20	
Unmarked				17	22	Concrete tomb
Unmarked				17	23	Concrete tomb
Unmarked				18	1	Next to Vermillion River
Unmarked				18	2	
Unmarked				18	3	
Unmarked				18	5	Iron cross
Unmarked				18	6	Iron cross
Unmarked				18	7	Iron cross
Unmarked				18	8	Iron cross

Table 9, continued

NAME	DATE OF BIRTH	DATE OF DEATH	AGE AT DEATH	ROW	TOMB	ADDITIONAL INFORMATION
Unmarked				18	9	Baby; iron cross
Unmarked				18	10	Baby; iron cross
Unmarked				18	11	Baby; iron cross
Unmarked				18	13	Concrete and iron crosses
Unmarked				18	15	Concrete tomb
Unmarked				18	16	Concrete tomb
Unmarked				18	17	Concrete tomb
Unmarked				G-1	6	New tomb; June 1993
Unmarked				13	4	Baby; concrete
Unmarked				1	9	Grass tomb; iron cross
Unmarked				15	11	Concrete; iron cross, fenced
Unmarked				15	12	Concrete tomb; iron cross; fenced
Unmarked				1	1	Brick tomb
Unmarked				9	1	Grass tomb, iron cross
Unmarked				15	6	Brick Tomb
Unreadable				17	11	Baby
Unreadable				G-2	7	Concrete tomb
Unreadable				2	7	
Unreadable				3	10	Concrete tomb with concrete cross
Unreadable				6	5	Concrete tomb with 5 crosses
				1	8	Grass area, 20 feet
				4	6	Grass area, 10 feet
				6	4	Grass area, 10 feet
				6	6	Grass area, 10 feet
				7	2	Grass area, 10 feet
				9	8	Grass area, 10 feet
				11	2	Grass area, 10 feet
				11	15	Grass area, 10 feet, some brick in grass
				12	10	Grass area, 10 feet
				13	15	Grass area, 10 feet
				16	11	Grass area, 10 feet
				14	7	Grass area, 15 feet
				14	21	Grass area, 15 feet
				3	2	Grass area, 20 feet
				10	13	Grass area, 20 feet , iron cross and brick
				11	7	Grass area, 20 feet
				13	10	Grass area, 20 feet
				14	10	Grass area, 20 feet
				16	24	Grass area, 20 feet
				8	6	Grass area, 30 feet
				8	8	Grass area, 30 feet
				16	14	Grass area, 30 feet
				18	14	Grass area, 35 feet
				17	5	Grass area, 50 feet
				15	21	Grass area, 8 feet
				5	3	Grass tomb, pipe cross
				13	8	Grass tomb, iron cross
				14	9	Grass tomb, iron cross
				16	10	Grass tomb, iron cross

Table 10. Mortality trends of Burials in the Picard Cemetery (information based on marked graves only).

Total Number of Females	32
Average Age of Death of Females	67
Total Number of Males	54
Average Age of Death of Males	58
19th Century Average Age at Death	66
19th Century Female Average Age at Death	67
19th Century Male Average Age at Death	66
20th Century Average Age at Death	58
20th Century Female Average Age of Death	67
20th Century Male Average Age at Death	52

Infant burial practices at the Picard Cemetery also were examined. A list of the known infant burials at the Picard Cemetery is presented in Table 11. Because the majority of these graves were marked with iron crosses and lacked inscriptions, it was not possible to include them in the mortality study. Similarly, it could not be determined if there was any difference in nineteenth century versus twentieth century infant mortality rates. The survey did identify, however, a cluster of infant burials located at the west end of the cemetery, primarily in rows 13 to 18 (Figure 54). The apparent segregation of these infants into one area may be the result of the Catholic Church's practice of prohibiting the burial of unbaptized children in consecrated ground (Kselman 1993). As Kselman (1993) notes, the interment of unbaptized children away from those who were baptized was already an issue in early nineteenth century France. Likewise, non-Catholics and those who committed suicide were not buried in ground deemed sacred by the Catholic Church. The French took this issue so seriously that in 1838, a Catholic priest refused to allow a mother and her baby who died during childbirth to be buried together. Despite the protests of family and friends, the priest opened the coffin and removed the child so that it would be buried separate from its mother. It was not uncommon for officials of the Catholic Church to exhume the bodies of those who, because of religious denomination or lack of baptism, were deemed unfit for burial in a consecrated Catholic cemetery (Kselman 1993). Reflecting this practice is the fact that two of the four infants that were not buried in the west end of the cemetery (rows 13 to 18) were children who had lived long enough to be given names. The fact that they may have

Table 11. Infants buried at the Picard Cemetery.

NAME	DATE OF BIRTH	DATE OF DEATH	AGE AT DEATH	ROW	TOMB	ADDITIONAL INFORMATION
Breaux, Cleatis	Apr. 19, 1916	Sept. 17, 1917	1	3	1	Baby, concrete cross
Unmarked				9	9	Baby; brick with iron cross
Unmarked				10	10	Baby; concrete tomb; iron cross
Picard, Celiman	Mar. 14, 1861			11	6	Child of Auguste P. Picard
Unmarked				13	4	Baby; concrete
Unmarked				13	7	Baby; concrete
Unmarked				13	12	Baby; concrete tomb; concrete cross
Unmarked				13	14	Baby; brick tomb; iron cross
Bourque, Twins				14	6	Baby graves, concrete
Unmarked				15	8	Baby; concrete tomb
Unmarked				15	9	Baby; brick tomb
Unmarked				16	1	Baby; two iron crosses
Unmarked				16	3	Baby; one iron cross
Unmarked				16	4	Baby
Unmarked				16	5	Baby
Unmarked				16	16	Baby; at foot of fifteen
Unmarked				16	19	Baby; iron cross; fenced
Trahan, Alvin L.				16	20	Baby; iron cross; fenced
Unmarked				16	23	Baby; two crosses fenced
Unreadable				17	11	Baby
Unmarked				18	9	Baby; iron cross
Unmarked				18	10	Baby; iron cross
Unmarked				18	11	Baby; iron cross

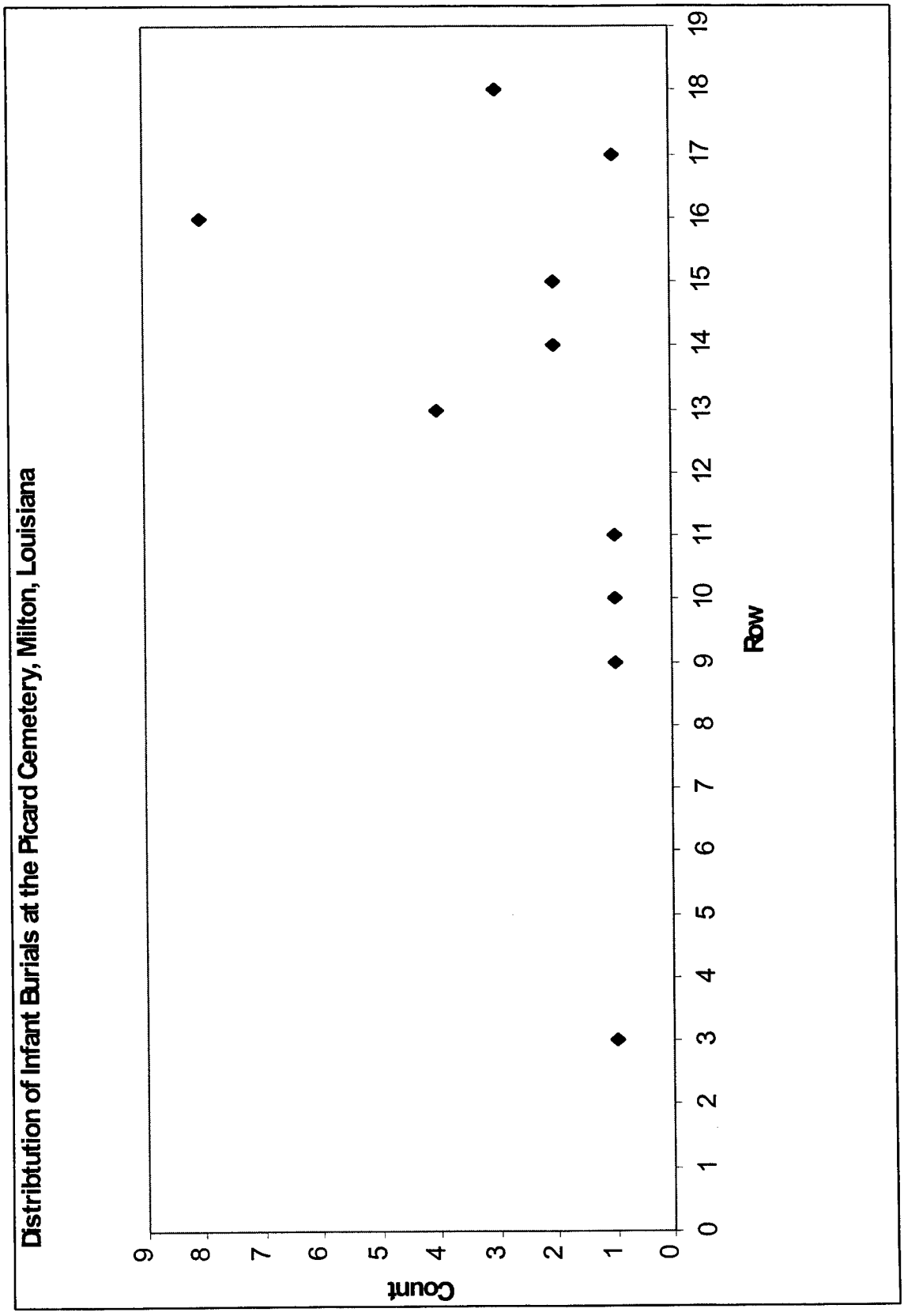


Figure 54. Distribution of infant burials at the Picard Cemetery.

tions and are therefore not relevant to genealogical studies. This may likewise explain the absence of a research focus on iron crosses.

Simple economics may have influenced the widespread use of the iron cross gravemarker in Louisiana. Southern Louisiana possesses little raw material for the manufacture of gravemarkers. Granite, sandstone, or marble must be imported from the eastern states or from elsewhere. Wooden markers, though easily obtained, deteriorate quickly. Iron, which is more durable than wood but less durable than stone, may have presented an affordable compromise.

Although there is little general information on the use of iron crosses, a recent study of 13 cemeteries in the Lower Red River valley of north-central Louisiana inventoried 466 iron cross gravemarkers (Ortigo 1988). Only 95 (20 percent) of these, however, were inscribed with dates. The earliest date inscribed on the crosses in the Red River valley study was 1727. Most of the inscriptions predated 1899, leading the author to conclude that the crosses were used primarily between 1727 and 1899.

Iron Cross Types

The styles of iron crosses identified in the Lower Red River valley study ranged from ornate to utilitarian, but the majority were of utilitarian style. The oldest crosses were formed from a single piece of iron. Later styles were formed from two pieces of iron connected with a brad at the crosspoint where the vertical bar and the cross bar, or transept, met (Ortigo 1988). Although not stated explicitly, it is probable that the older single-piece crosses identified by Ortigo were wrought iron while the newer two-piece crosses were formed from separate pieces of steel.

The Lower Red River valley study categorized the iron crosses into eight basic styles (Figure 56) (Ortigo 1988). These styles, called *types* for the purposes of this study, were utilized for classifying the iron crosses identified in the Picard Cemetery. These crosses consisted of:

> **Type 1.** Type 1 crosses are two pieces of steel, joined with a brad at the crosspoint with the ends of each transept and vertical bar split and flared. There are a number of variations in design of the terminal flares.

> **Type 2.** Type 2 crosses are two-piece steel iron utilitarian styles. The ends may be squared, rounded, or pointed, but are not flared.

> **Type 3.** Type 3 crosses are two-piece steel iron with the ends of the transept and vertical bars hammered flat into round, oval, spade, or square patterns and perforated. The perforations may be large or small.

> **Type 4.** Type 4 crosses are two-piece steel iron with the ends of the transept flared into round, oval, or spade design. There is no perforation.

> **Type 5.** Type 5 crosses are two-piece steel iron with the ends of the transept and vertical bars squared or indented and an additional design cut into the terminus.

> **Type 6.** Type 6 crosses are openwork one-piece wrought, steel, or "bent iron".

> **Type 7.** Type 7 crosses are any of the above two-piece designs to which an inscription plate has been attached to or below the crosspoint. The plate, usually of metal, may be round, square, diamond, heart, or star shaped.

> **Type 8.** Type 8 crosses are steel iron or wrought iron, more ornate and free form in design, or with additional fretwork or filigree attached.

Some of the crosses may incorporate the characteristics of two or more of these types. Type 8 is used as a miscellaneous category for crosses that do not fall within Types 1 - 7 and they possess unique or ornate characteristics. All of the types are considered basic utilitarian except for types six, seven, and eight which exhibit some degree of originality or customization in design and often are inscribed with the identity of the deceased. The Lower Red River valley study does not quantify data on the frequencies of occurrence of the cross types. The report does state, however, that types 1-5 were the most common and they were present in all 13 cemeteries.

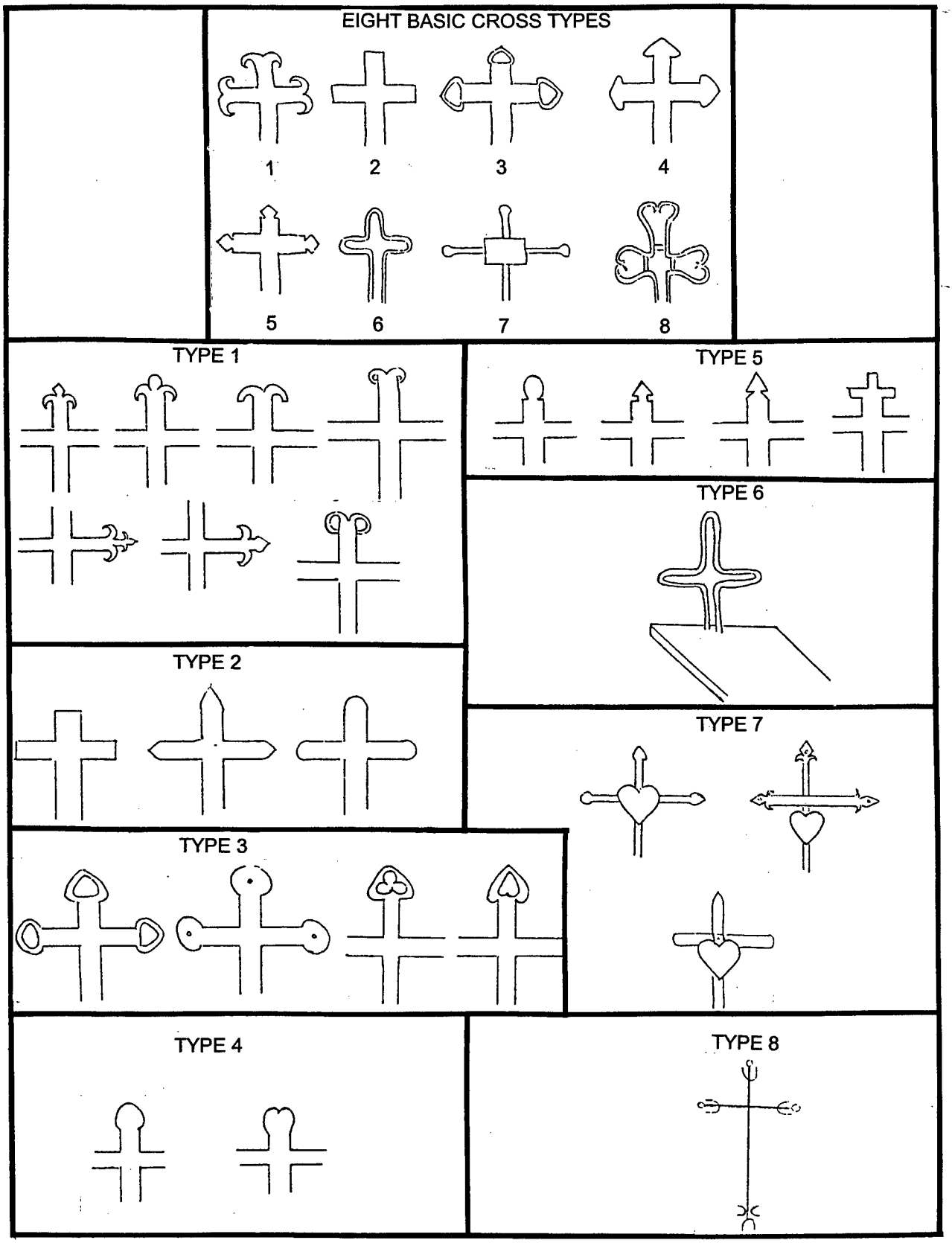


Figure 56. Eight basic cross types identified by Ortigo.

Iron Cross Gravemarkers at the Picard Cemetery

During the Phase I cultural resources survey and archeological inventory of the proposed dredged material disposal area, R. Christopher Goodwin and Associates, Inc., attempted to classify all iron crosses listed in the 1993 inventory of the Picard Cemetery performed by the Lafayette Genealogical Society (Landry and Bourque 1993). Iron crosses were typed according to the styles defined in the Lower Red River valley study (Ortigo 1988). It also was noted if the iron crosses were associated with stone, brick, or cement tombs or markers. Inscriptions also were recorded.

A total of 81 iron crosses were identified at the Picard Cemetery. Approximately one-third (n=28) of the crosses were Type 1 and one-third (n=27) of the crosses were Type 4. Seven crosses were classified as Type 2, three as Type 3, 13 as Type 5, one as Type 6, and two as Type 7 (Figure 57). Finally, two of the Type 2 utilitarian crosses, though simple in design, were customized and constructed from modern metal tubular pipe.

A total of seven crosses, or nine percent of the total, had nameplates or inscriptions located on the cross itself. One Type 1 cross had an illegible name plate. One Type 2 cross, made from metal tubular piping, had "Cloteaux" inscribed on the nameplate, and one Type 3 cross had a nameplate inscribed with three names: "Thibodeaux, Broussard, Broussard." No date of death was noted on either of these crosses. The two Type 7 crosses, by definition, had nameplates; one was a metal heart-shaped plate hand-etched with the inscription "Leoville Cloteaux, Born June 23, 1872, Died November 25, 1918," and one was a diamond-shaped marble plate inscribed "Louis Hebert," who, according to the Landry and Bourque (1993) inventory, died in 1928. These crosses, however, were not noted in the Landry and Bourque (1993) inventory. Only two crosses, both Type 5, were inscribed on the transept, and each of these belonged to the Trahan family. The dates of death associated with these two crosses were 1914 and 1928 (Landry and Bourque 1993; Table 9).

A total of 11 iron crosses, or 14 percent of those identified at the Picard Cemetery, marked infant burials, all but one of which were unnamed in the 1993 survey by Landry and Bourque (1993). As is shown in the mortality data presented above and listed in Table 9, most of these graves were clustered in rows 13 to 18. This area of the cemetery contained the majority of the unmarked (unnamed) graves, many of which were infant burials.

A total of 58 iron crosses, or 72 percent of those identified, were associated with more permanent markers such as tombs or headstones constructed of stone, brick, or cement (Table 9). Over 81 percent (n=47) of these burials were listed as unmarked in the cemetery survey (Landry and Bourque 1993). Those with legible dates totaled five. The dates of death on these marked graves were 1907, 1914 (2), 1923, and 1976.

Summary and Conclusions

Nearly all of the iron crosses inventoried at Picard Cemetery were of the utilitarian type. Only one cross was classified as a wrought or free form cross. Over 96 percent of the crosses were identified as Types 1 through 5. This pattern was observed, though not quantified, in the Lower Red River Valley study (Ortigo 1988). It also was noted that the large majority of iron crosses identified in the Lower Red River Valley study were of utilitarian Types 1 through 5.

Although the date range of use of the iron cross in the Lower Red River Valley shows that these gravemarkers were common from 1727 to 1899, evidence at the Picard Cemetery shows that the use of the iron cross in southern Louisiana extended into the period from 1907 to 1928. The latest date for use of the iron cross in the Red River study was 1971, while one cross from the Picard Cemetery was associated with a date of 1949 and one was associated with a date of 1976. These data indicate the iron cross gravemarker in Louisiana has a long history and that it continued to be used into the late twentieth century.

Only nine percent of the iron crosses identified in the Picard Cemetery had nameplates or inscriptions compared with 20 percent with inscriptions in the Red River Valley study (Ortigo 1988). This discrepancy may be due to the small sample size at the Picard Cemetery (the data collected from the Red River valley encompassed 13 cemeteries and represented a total of 466 crosses). Approximately 14 percent of the iron crosses recorded at the Picard Cemetery are known to mark the graves of infants. Many of these iron crosses were located in the area of the cemetery where unnamed infants or unnamed graves were

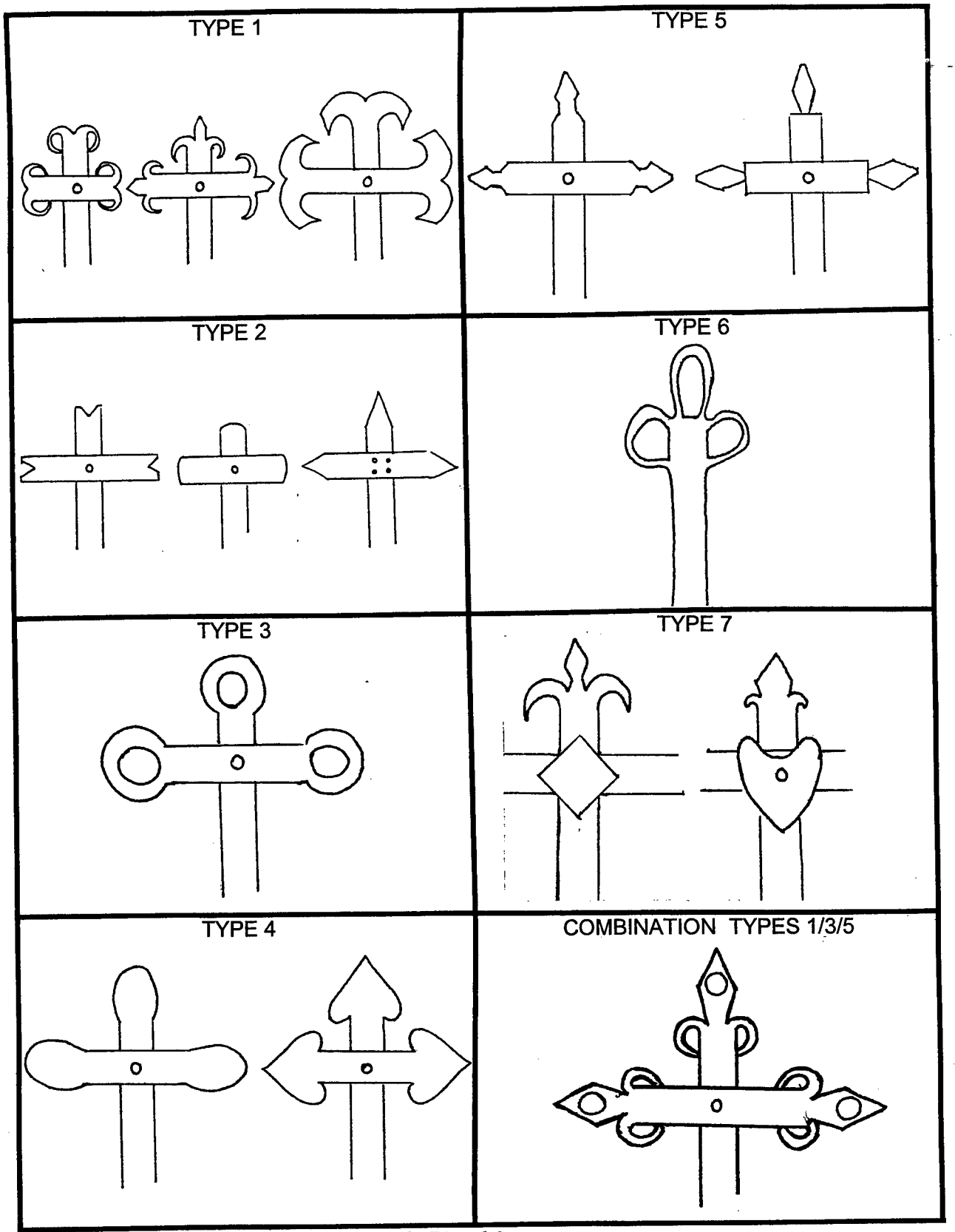


Figure 57. ***Iron cross types identified at the Picard Cemetery.***

placed. Although the sample size was small, these data indicate that the most common use of utilitarian iron crosses was to mark otherwise unknown graves, a practice that may reflect the lower socio-economic status of the deceased.

Although 72 percent of the iron crosses are associated with cement or brick tombs, or stone markers, over 80 percent of these are unmarked and are unnamed in the cemetery records. It could not be determined if the iron crosses were placed at the grave prior to the placement of the cement or brick tombs or stone markers.

This brief study of iron cross gravemarkers at the Picard Cemetery provides quantified data from one cemetery in southern Louisiana. More data are needed to test the ideas proposed here. This study may provide a quantified baseline as well as a methodology for future research into the use of the ubiquitous iron crosses in southern Louisiana.

CHAPTER VII

SUMMARY AND RECOMMENDATIONS

R. Christopher Goodwin & Associates, Inc., conducted a Phase I cultural resources survey and archeological inventory of the proposed Vermilion Dredge Maintenance Project in Lafayette Parish, Louisiana. The project was completed on behalf of the U.S. Army Corps of Engineers, New Orleans District, and it included a marine component located between River Mile 47.5 and 48.8 of the Vermilion River, and a 35 ac (14.2 ha) terrestrial component. The results of this investigation are summarized briefly below.

Underwater Survey

The underwater portion of the proposed project corridor was located south of the City of Lafayette in Lafayette Parish, Louisiana. During the marine remote sensing survey, approximately 4.3 km (2.7 linear miles) of river bottom were surveyed. The primary objective of this study was to identify all submerged and visible watercraft and other maritime cultural resources situated in the Vermilion River project item. The significance of these resources was assessed applying the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]).

The marine remote sensing survey included the use of side scan sonar, a recording proton precession magnetometer, and a fathometer. The investigation identified 21 magnetic anomalies and 10 acoustic anomalies. The magnetic data recorded during survey contained a significant level of magnetic "noise" caused by modern sources. These sources included iron and wooden bulkheads, concrete and metal debris, overhead powerlines, drainage outflows, and a boat launch. The acoustic data recorded during survey identified numerous isolated targets that appeared to be modern debris. This confirms the trends observed within the magnetic data. The magnetic and acoustic data recorded during the riverine survey of the Vermilion River contained significant amounts of debris, but these data do not include anomalous readings consistent with those submerged cultural resources. No additional testing is recommended for the riverine portion of the Vermilion River Dredge Maintenance Project.

Terrestrial Survey

The terrestrial portion of the proposed project area was surveyed and inventoried through a combination of pedestrian survey and shovel testing, magnetometer survey, probing, and auger testing. A total of three archeological sites (16LY94, 16LY95, and 16LY97), two non-site cultural resources loci (4-1 and 5-1), and one standing structure older than 50 years in age (SS 669) were identified as a result of this investigation.

Site 16LYL94

Site 16LY94 is an artifact scatter associated with the former location of an early nineteenth to early twentieth century domestic dwelling. No cultural features and only a low density of historic artifacts were identified during the Phase I cultural resources survey and archeological inventory of Site 16LY94 The relatively sparse artifact scatter probably represents the

remains of a sheet midden formed in the yard area of the former structure. The destruction of this dwelling and subsequent plowing has compromised the integrity of the cultural deposits. Site 16LY94 does not possesses research potential; it does not possess the qualities of significance as defined by the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]). No additional testing of Site 16LY94 is recommended.

Site 16LY95

Site 16LY95 is a nineteenth to twentieth century refuse disposal area. This relatively small concentration of historic artifacts lacks both integrity and research potential. It does not possess the qualities of significance as defined by the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]). No additional archeological testing of Site 16LY95 is recommended.

Site 16LY97

The Picard Cemetery dates from the mid-nineteenth century. It is located in the southwestern corner of the project area and it measures approximately 100 m (329 ft) in length x 50 m (164 ft) in width. The oldest portion of this former family cemetery fronts the Vermilion River. A 15 m (49 ft) buffer zone on the north and east sides of the cemetery was surveyed to check for unmarked graves. Magnetometer survey in the buffer zone and subsequent field testing of the results identified a buried brick rubble pile but it did not provide conclusive evidence of the absence or presence of unmarked graves outside of the current cemetery fence. The poor results are due to the wet soil conditions and magnetic disturbances (e.g., chain link fence) that severely hampered the attempt to locate these subsurface features. A remnant fenceline is located along the northern portion of the project area and outside of the modern boundaries of the cemetery. This remnant fenceline reinforces anecdotal information provided by the current property owner that suggests the current northern fenceline of the cemetery may not represent the original cemetery boundary (Bourque 1998, personal communication). Site 16LY97 was assessed as not significant applying the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]) as cemeteries normally are not eligible for listing in the Register. Nonetheless, avoidance of the cemetery and the 15 m (49 ft) buffer zone is recommended.

Locus 4-1

Locus 4-1 produced a single prehistoric lithic flake. A total of six shovel tests and two auger tests were excavated in the vicinity of this find during the subsequent locus delineation process. None of these shovel or auger tests produced cultural material or evidence of intact cultural deposits. These results demonstrate that Locus 4-1 does not possess the qualities of significance as defined by the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]). No additional testing of this locus is recommended.

Locus 5-1

Locus 5-1 was identified when several brick fragments were observed in a shovel test. A total of four shovel tests were excavated at Locus 5-1 during the subsequent locus delineation process. None of the delineation shovel tests produced cultural material or evidence of intact cultural deposits. Locus 5-1 does not possess the qualities of significance as defined by the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]). No additional testing of this locus is recommended.

Standing Structure 1

Standing Structure 1 (SS 669) is a typical example of a locally and regionally common barn type. It possesses no known historical associations of transcending importance and it is not significant locally. The barn does not possess the qualities of significance as defined by the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]). No additional architectural recordation of SS 669 is recommended.

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APPENDIX I

ARTIFACTS RECOVERED DURING SURVEY

Table 1. Historic/Modern Artifacts Recovered during Phase I Pedestrian Survey and Shovel Testing of the Proposed Vermilion Dredge Maintenance Project Item.

FS	SITE/ LOCUS #	SEG	TR	ST	METER	NORTH	EAST	STR	LEV	TE	BE	ADDITIONAL PROVENIENCE	CT	CLASS	TYPE	SUBTYPE	VESSEL PORTION	ADDITIONAL DESCRIPTION
17	05-01		5	3	60			I	1	0	20		4	Construction Materials	Architectural Stone	Brick Fragment(s)		Orange-red paste with lots of inclusions
1	16LY94		1	6	150			I	1	0	20		1	Ceramic	Domestic Brown Stoneware	Salt-Glazed w/Int. Albany Slip-glazed on Buff-body	Body(s)	
2	16LY94		2	5	135			I	1	0	20		1	Ceramic	Whiteware	Plain	Body(s)	Bowl
3	16LY94		2	6	165			I	1	0	20		1	Glass	Pressed Glass	Yellow	Body(s)	Embossed oak leaf on exterior
4	16LY94		2	10	285			I	1	0	20		7	Metal	Miscellaneous Hardware	Barbed Wire fragment(s)		
15	16LY94		4	8	195			I	1	0	20		1	Ceramic	Pearlware	"Willow" Transfer-printed	Body(s)	Italianate building print on exterior
6	16LY94					970	1000	I	1	0	20		1	Ceramic	Ironstone	Undecorated White	Body/ Base	Foot pedestal; plate
6	16LY94					970	1000	I	1	0	20		2	Glass	Unid. Molded Technique	Dark Green	Indeterminate	
6	16LY94					970	1000	I	1	0	20		1	Glass	Unidentified Glass shard(s) (Kitchen)	Light Aqua	Indeterminate	Cold-mold marks
5	16LY94					970	1030	I	1	0	20		2	Construction Materials	Architectural Stone	Brick Fragment(s)		
5	16LY94					970	1030	I	1	0	20		1	Glass	Unid. Molded Technique	Yellow Green (Olive)	Body(s)	
5	16LY94					970	1030	I	1	0	20		1	Glass	Unidentified Glass shard(s) (Kitchen)	Colorless	Indeterminate	
5	16LY94					970	1030	I	1	0	20		1	Metal	Construction Hardware	Spike(s)		Possibly a pinched railroad spike
7	16LY94					970	1060	I	1	0	20		1	Ceramic	Ironstone	Undecorated White	Body(s)	
7	16LY94					970	1060	I	1	0	20		1	Glass	Lamp Glass	Colorless		Light green
24	16LY94					977.5	1000	II	1	13	28		1	Ceramic	Domestic Brown Stoneware	Salt-glazed w/Int. Lead Glaze on Buff	Body(s)	Interior brown lead glaze

Table 1, continued

FS	SITE/ LOCUS #	SEG	TR	ST	METER	NORTH	EAST	STR	LEV	TE	BE	ADDITIONAL PROVENIENCE	CT	CLASS	TYPE	SUBTYPE	VESSEL PORTION	ADDITIONAL DESCRIPTION
24	16LY94					977.5	1000	II	1	13	28		1	Ceramic	Domestic Brown Stoneware	Salt-glazed w/Int. Lead Glaze on Buff	Body(s)	Interior brown lead glaze
24	16LY94					977.5	1000	II	1	13	28		1	Glass	Unid. Molded Technique	Amethyst-colored (Manganese Solarization)	Body(s)	Side panel; "...UGE"
24	16LY94					977.5	1000	II	1	13	28		2	Metal	Miscellaneous Hardware	Barbed Wire fragment(s)		
24	16LY94					977.5	1000	II	1	13	28		2	Metal	Unidentified Metal	Iron/Steel		
24	16LY94					977.5	1000	II	1	13	28		1	Metal	Unidentified Metal	Unidentified Lead Object(s)		Cast lead bar
25	16LY94					977.5	1030	I	1	0	20		1	Ceramic	Tin-Enamelled Earthenware	Faience	Rim(s)	Brick red paste; Rouen plain; bowl
25	16LY94					977.5	1030	I	1	0	20		1	Ceramic	Whiteware	Underglaze Hand-painted	Body(s)	Green foliate design on interior; saucer
25	16LY94					977.5	1030	I	1	0	20		1	Glass	Window Glass shard(s)			
25	16LY94					977.5	1030	I	1	0	20		1	Shell	Shell (Miscellaneous)	Rangia Shell		
8	16LY94					985	1000	I	1	0	20		1	Ceramic	Yellowware	Sponged/Spatter Decorated	Body(s)	Blue on white indeterminate sponged design on exterior
8	16LY94					985	1000	I	1	0	20		1	Glass	Unid. Molded Technique	Light Aqua	Body(s)	"D"; soda bottle
9	16LY94					985	1015	II	1	19	39		1	Ceramic	Ironstone	Mold Decorated	Body(s)	London-style cup
9	16LY94					985	1015	II	1	19	39		1	Glass	Machine-Made Bottle Glass	Amethyst-colored (Manganese Solarization)	Body(s)	
9	16LY94					985	1015	II	1	19	39		1	Glass	Unid. Molded Technique	Light Aqua	Heel(s)	Soda bottle

Table 1, continued

FS	SITE/ LOCUS #	SEG	TR	ST	METER	NORTH	EAST	STR	LEV	TE	BE	ADDITIONAL PROVENIENCE	CT	CLASS	TYPE	SUBTYPE	VESSEL PORTION	ADDITIONAL DESCRIPTION
9	16LY94					985	1015	II	1	19	39		1	Metal	Construction Hardware	Bolt(s) and/or Bracket(s)		Square head
10	16LY94					985	1030	II	1	20	40		1	Ceramic	Whiteware	Plain	Body(s)	
10	16LY94					985	1030	II	1	20	40		1	Ceramic	Whiteware	Scalloped Rim, impressed curved lines	Rim(s)	Plate; blue shell edge
26	16LY94					1000	1015	II	1	13	33		1	Ceramic	Pearlware	Undecorated	Body(s)	
26	16LY94					1000	1015	II	1	13	33		1	Ceramic	Whiteware	Plain	Body(s)	Saucer
11	16LY94					1015	1000	I	1	0	20		1	Ceramic	Ironstone	Transfer-printed	Body(s)	Red geometric print on interior; saucer or plate?
11	16LY94					1015	1000	I	1	0	20		1	Ceramic	Ironstone	Undecorated White	Body(s)	
11	16LY94					1015	1000	I	1	0	20		1	Ceramic	Whiteware	Unscalloped, unmolded	Rim(s)	Plate; hand-painted blue shell edge; slightly burned
11	16LY94					1015	1000	I	1	0	20		1	Construction Materials	Architectural Stone	Brick, Shiner		
11	16LY94					1015	1000	I	1	0	20		2	Glass	Unid. Molded Technique	Yellow Green (Olive)	Eroded/ Spalled	
11	16LY94					1015	1000	I	1	0	20		1	Metal	Furniture	Stove Part(s)		
29	16LY94					1030	1037.5	I	2	20	40		1	Ceramic	Whiteware	Plain	Rim(s)	Cup or bowl
29	16LY94					1030	1037.5	I	2	20	40		1	Glass	Unid. Molded Technique	Dark Green	Body(s)	
27	16LY94					1030	1050.5	II	1	17	34		2	Ceramic	Cream-Colored Ware (Earthenware)	Plain	Body(s)	
12	16LY94					1030	1060	I	2	20	38		1	Construction Materials	Architectural Stone	Brick Fragment(s)		
12	16LY94					1030	1060	I	2	20	38		2	Construction Materials	Architectural Stone	Brick, Shiner		

Table 1, continued

FS	SITE/ LOCUS #	SEG	TR	ST	METER	NORTH	EAST	STR	LEV	TE	BE	ADDITIONAL PROVENIENCE	CT	CLASS	TYPE	SUBTYPE	VESSEL PORTION	ADDITIONAL DESCRIPTION
28	16LY94					1037.5	1045	II	1	37	50		1	Glass	Unid. Molded Technique	Dark Green	Shoulder(s)	
13	16LY94					1045	1045	I	1	0	20		2	Ceramic	Whiteware	Plain	Base(s)	
13	16LY94					1045	1045	I	1	0	20		1	Glass	Unid. Molded Technique	Dark Green	Rim(s)	Bowl with rolled rim
14	16LY94					1075	970	I	1	0	20		1	Ceramic	Domestic Gray Stoneware	Lead-glazed	Body(s)	Brown lead glaze exterior, slip interior; jar
18	16LY95		6		315							Surface Collection; 10m radius	2	Ceramic	Domestic Brown Stoneware	Opaque Glaze on Buff	Body(s)	
18	16LY95		6		315							Surface Collection; 10m radius	1	Ceramic	Domestic Brown Stoneware	Opaque Glaze on Buff	Body(s)	Embossed banding on exterior
18	16LY95		6		315							Surface Collection; 10m radius	1	Ceramic	Domestic Brown Stoneware	Opaque Glaze on Buff	Body/ Base	Platter?
18	16LY95		6		315							Surface Collection; 10m radius	1	Ceramic	Domestic Brown Stoneware	Opaque Glaze on Buff	Rim(s)	Strap rim
18	16LY95		6		315							Surface Collection; 10m radius	5	Ceramic	Domestic Brown Stoneware	Opaque Glaze w/Int. Albany Slip-glaze on Buff	Body/ Base	Mend
18	16LY95		6		315							Surface Collection; 10m radius	1	Ceramic	Domestic Brown Stoneware	Sponge/Spatter on Buff	Lid(s)	Blue sponged decoration on embossed scroll design on exterior
18	16LY95		6		315							Surface Collection; 10m radius	1	Ceramic	Whiteware	Flow Blue	Body(s)	Indeterminate design on both interior and exterior; bowl

Table 1, continued

FS	SITE/ LOCUS #	SEG	TR	ST	METER	NORTH	EAST	STR	LEV	TE	BE	ADDITIONAL PROVENIENCE	CT	CLASS	TYPE	SUBTYPE	VESSEL PORTION	ADDITIONAL DESCRIPTION
18	16LY95		6		315							Surface Collection; 10m radius	3	Glass	Cup Bottom Mold	Amethyst-colored (Manganese Solarization)	Body/ Base	Mend
18	16LY95		6		315							Surface Collection; 10m radius	1	Glass	Lettered-plate Bottle Mold	Amethyst-colored (Manganese Solarization)	Body(s)	"V. E." in recessed panel
18	16LY95		6		315							Surface Collection; 10m radius	1	Glass	Lid Liner	Opaque White / Milk Glass	Lid(s)	"G"
18	16LY95		6		315							Surface Collection; 10m radius	1	Glass	Machine-Made Base	Amethyst-colored (Manganese Solarization)	Base(s)	"[G]LASS M.../ PAT..."
18	16LY95		6		315							Surface Collection; 10m radius	1	Glass	Machine-Made Base	Colorless	Heel(s)	
18	16LY95		6		315							Surface Collection; 10m radius	1	Glass	Machine-Made Bottle Glass	Colorless	Body(s)	Mold decorated; jar?
18	16LY95		6		315							Surface Collection; 10m radius	1	Glass	Machine-Made Bottle Glass	Colorless	Lid(s)	Canning jar; rounded square
18	16LY95		6		315							Surface Collection; 10m radius	1	Glass	Machine-Made Bottle Glass	Colorless	Neck(s)	Continuous thread lip
18	16LY95		6		315							Surface Collection; 10m radius	1	Glass	Machine-Made Bottle Glass	Colorless	Neck(s)	Possibly a canning jar
18	16LY95		6		315							Surface Collection; 10m radius	1	Glass	Machine-Made Bottle Glass	Green	Neck(s)	Continuous thread lip; canning jar

Table 1, continued

FS	SITE/ LOCUS #	SEG	TR	ST	METER	NORTH	EAST	STR	LEV	TE	BE	ADDITIONAL PROVENIENCE	CT	CLASS	TYPE	SUBTYPE	VESSEL PORTION	ADDITIONAL DESCRIPTION
18	16LY95		6		315							Surface Collection; 10m radius	1	Glass	Unid. Molded Technique	Cobalt Blue	Body/ Base	Heel and body
18	16LY95		6		315							Surface Collection; 10m radius	1	Glass	Unid. Molded Technique	Colorless	Indeterminate	
18	16LY95		6		315							Surface Collection; 10m radius	1	Glass	Unid. Molded Technique	Green	Body(s)	Possibly mends with the other green glass shard
18	16LY95		6		315							Surface Collection; 10m radius	1	Glass	Unidentified Glass shard(s) (Kitchen)	Light Aqua	Indeterminate	
22	16LY95					970	995	I	1	0	20	5m W radial	1	Metal	Unidentified Metal	Iron/Steel		Thin iron bar
19	16LY95					970	1000	I	1	0	20		37	Ceramic	Domestic Brown Stoneware	Salt-glazed w/Int. Lead Glaze on Buff	Body/ Base	Mend; storage jar
19	16LY95					970	1000	I	1	0	20		3	Ceramic	Unidentified Ceramics	Unidentified Burned Earthenware	Rim/ Body	Possibly mends; probably clear glazed ironstone or whiteware severely burned; cup
19	16LY95					970	1000	I	1	0	20		1	Construction Materials	Architectural Stone	Brick Fragment(s)		Burned
19	16LY95					970	1000	I	1	0	20		1	Glass	Lamp Glass	Colorless		
19	16LY95					970	1000	I	1	0	20		1	Glass	Machine-Made Base	Colorless	Base(s)	Non-recessed panel bottle; production marks on base
19	16LY95					970	1000	I	1	0	20		1	Glass	Machine-Made Base	Colorless	Body/ Base	Owen's scar
19	16LY95					970	1000	I	1	0	20		2	Glass	Machine-Made Bottle Glass	Amber	Body(s)	Possibly a beer bottle

Table 1, continued

FS	SITE/ LOCUS #	SEG	TR	ST	METER	NORTH	EAST	STR	LEV	TE	BE	ADDITIONAL PROVENIENCE	CT	CLASS	TYPE	SUBTYPE	VESSEL PORTION	ADDITIONAL DESCRIPTION
19	16LY95					970	1000	I	1	0	20		1	Glass	Machine-Made Bottle Glass	Amethyst-colored (Manganese Solarization)	Lid(s)	Possibly a canning jar lid
19	16LY95					970	1000	I	1	0	20		1	Glass	Machine-Made Bottle Glass	Aqua	Body(s)	"[M]ASON" jar
19	16LY95					970	1000	I	1	0	20		1	Glass	Machine-Made Bottle Glass	Colorless	Body(s)	"E"
19	16LY95					970	1000	I	1	0	20		1	Glass	Machine-Made Bottle Glass	Colorless	Body(s)	"ON..."
19	16LY95					970	1000	I	1	0	20		3	Glass	Machine-Made Bottle Glass	Colorless	Body(s)	Mend; "Ball's P[erfect Mason Jar]"
19	16LY95					970	1000	I	1	0	20		1	Glass	Machine-Made Bottle Glass	Colorless	Complete	Ink well; (maker's mark: Hazel-Atlas Glass Co.)
19	16LY95					970	1000	I	1	0	20		1	Glass	Machine-Made Bottle Glass	Colorless	Lip(s)	Brandy lip
19	16LY95					970	1000	I	1	0	20		1	Glass	Machine-Made Bottle Glass	Colorless	Lip(s)	Patent/ extract lip; oval-type flask
19	16LY95					970	1000	I	1	0	20		1	Glass	Machine-Made Bottle Glass	Colorless	Neck(s)	Possibly ink well or culinary
19	16LY95					970	1000	I	1	0	20		2	Glass	Unid. Molded Technique	Amethyst-colored (Manganese Solarization)	Neck(s)	Mend
19	16LY95					970	1000	I	1	0	20		2	Glass	Unid. Molded Technique	Aqua	Body(s)	Mend; possibly mends with aqua Mason jar
19	16LY95					970	1000	I	1	0	20		5	Glass	Unid. Molded Technique	Colorless	Body(s)	
19	16LY95					970	1000	I	1	0	20		2	Glass	Unid. Molded Technique	Colorless	Body(s)	Multiple-sided bottle
19	16LY95					970	1000	I	1	0	20		5	Glass	Unid. Molded Technique	Colorless	Body(s)	Thin fragments

Table 1, continued

FS	SITE/ LOCUS #	SEG	TR	ST	METER	NORTH	EAST	STR	LEV	TE	BE	ADDITIONAL PROVENIENCE	CT	CLASS	TYPE	SUBTYPE	VESSEL PORTION	ADDITIONAL DESCRIPTION
19	16LY95					970	1000	I	1	0	20		2	Glass	Unid. Molded Technique	Colorless	Shoulder(s)	
19	16LY95					970	1000	I	1	0	20		3	Glass	Unid. Molded Technique	Green	Body(s)	Possibly mends with FS# 18
19	16LY95					970	1000	I	1	0	20		3	Glass	Unidentified Glass shard(s) (Kitchen)	Amber		
19	16LY95					970	1000	I	1	0	20		2	Glass	Unidentified Glass shard(s) (Kitchen)	Amethyst-colored (Manganese Solarization)	Indeterminate	
19	16LY95					970	1000	I	1	0	20		4	Glass	Unidentified Glass shard(s) (Kitchen)	Colorless	Indeterminate	
19	16LY95					970	1000	I	1	0	20		3	Metal	Miscellaneous Hardware	Barbed Wire fragment(s)		
19	16LY95					970	1000	I	1	0	20		1	Metal	Nail(s), Iron	Wire, Unidentified		
19	16LY95					970	1000	I	1	0	20		5	Metal	Storage Items	Iron Can(s)		
19	16LY95					970	1000	I	1	0	20		9	Metal	Unidentified Metal	Cast Iron		
19	16LY95					970	1000	I	1	0	20		1	Metal	Unidentified Metal	Iron/Steel		
19	16LY95					970	1000	I	1	0	20		8	Metal	Unidentified Metal	Iron/Steel		
23	16LY95					970	1005	I	1	0	20	5m E radial	1	Glass	Unidentified Glass shard(s) (Kitchen)	Colorless	Indeterminate	
21	16LY95					975	1000	I	1	0	20	5m N radial	1	Glass	Machine-Made Bottle Glass	Amber	Body(s)	"...OT"
21	16LY95					975	1000	I	1	0	20	5m N radial	1	Glass	Unid. Molded Technique	Amber	Body(s)	
21	16LY95					975	1000	I	1	0	20	5m N radial	2	Glass	Unid. Molded Technique	Colorless	Body(s)	

Table 1, continued

FS	SITE/ LOCUS #	SEG	TR	ST	METER	NORTH	EAST	STR	LEV	TE	BE	ADDITIONAL PROVENIENCE	CT	CLASS	TYPE	SUBTYPE	VESSEL PORTION	ADDITIONAL DESCRIPTION
20	16LY97					987.4	899.5	I	1	0	20		1	Glass	"Depression" Glass	Colorless	Body(s)	Embossed geometric pattern on exterior
20	16LY97					987.4	899.5	I	1	0	20		5	Glass	Machine-Made Bottle Glass	Colorless	Body(s)	
20	16LY97					987.4	899.5	I	1	0	20		1	Glass	Machine-Made Bottle Glass	Colorless	Complete	"Texsize" in script on shoulder; continuous thread lip (maker's mark: "T" inside a keystone)
20	16LY97					987.4	899.5	I	1	0	20		4	Metal	Miscellaneous Hardware	Iron Wire (non-barbed Wire) fragment(s)		

Table 2. Prehistoric Lithic Artifacts Recovered during Phase I Pedestrian Survey and Shovel Testing of the Proposed Vermilion Dredge Maintenance Project Item.

FS	SITE/ LOCUS #	SEG	TR	ST	METER	NORTH	EAST	STR	LEV	TE	BE	ADDITIONAL PROVENIENCE	CT	TYPE	SUBTYPE	LMT	TA	ADDITIONAL DESCRIPTION
16	04-01		4	22	615			I	1	0	20		1	Flake Tool	Edge Damaged, Utilized	Chert	No	2 edges utilized

APPENDIX II

SCOPE OF SERVICES

DEPARTMENT OF THE ARMY
NEW ORLEANS DISTRICT, CORPS OF ENGINEERS
P.O. BOX 60267
NEW ORLEANS, LOUISIANA 70160-0267

REPLY TO
ATTENTION OF:

March 2, 1998

Planning Division
Environmental Analysis Branch

Mr. William P. Athens
R. Christopher Goodwin
and Associates, Incorporated
5824 Plauche Street
New Orleans, Louisiana 70123

Dear Mr. Athens:

Reference is made to Contract No. DACW29-97-D-0018 for various cultural resources investigations. A work item under consideration for this contract is the performance of a cultural resources survey of Vermilion River Maintenance Dredging, Mile 47.5 to Mile 48.5. The effort is to be conducted as a separate delivery order under this contract. A scope of services for this project is enclosed.

Please provide your technical and cost proposal for this work as soon as possible, but no later than 1 week from your receipt of this letter. The original proposal should be provided to the contracting officer with two copies provided to me. I will serve as technical representative for this work. If you have any questions or require additional information, please contact me.

Sincerely,

Edwin A. Lyon
Contracting Officer's
Representative

Enclosure

Copy Furnished:

CEMVN-CT-T (Martha Sloan)

CEMVN-PD-RN February 25, 1998

SCOPE OF SERVICES
Contract DACW29-97-D-0018

CULTURAL RESOURCES INVESTIGATIONS FOR
VERMILION RIVER MAINTENANCE DREDGING
RIVER MILE 47.5 TO MILE 48.4

1. Introduction

This delivery order calls for a remote sensing survey for underwater cultural resources, coupled with a survey of a disposal area for Vermilion River Maintenance Dredging. The U.S. Army Corps of Engineers, New Orleans District (NOD) plans to dredge an area of the Vermilion River from River mile 47.5 to mile 48.4. An area indicated on the attached project map will be used for disposal of the dredged material.

2. Project Area

The project area is located along the Vermilion River. An area from River mile 47.5 to mile 48.4 will be dredged. A 35-acre upland disposal site will be used for placement of material excavated during routine maintenance of the Vermilion River. Excavated material will be placed in hopper barges and transported to the site, where a bucket dredge will off load the dredged material into the disposal area.

3. General Nature of the Work

The fieldwork will include both terrestrial and underwater survey methods to identify and record prehistoric and/or historic sites, shipwrecks, or other cultural resources which may exist in the project area. Terrestrial investigations are to include background research and pedestrian survey of the disposal area supplemented with the systematic excavation of shovel and/or auger tests. The underwater investigations will include a systematic magnetometer, side-scan sonar, and bathymetric survey using precise navigation control. All magnetic and sonar anomalies will be interpreted based on expectations of the character of shipwreck signatures. No diving will be performed under this delivery order.

4. Study Requirements

The study will be conducted utilizing current professional standards and guidelines including, but not limited to:

- the National Park Service's National Register Bulletin 15 entitled "How to Apply the National Register Criteria for Evaluation";

- the Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation as published in the Federal Register on September 29, 1983;

- Louisiana's Comprehensive Archaeological Plan, dated October 1, 1983;

- The Advisory Council on Historic Preservation's regulation 36 CFR Part 800 entitled, "Protection of Historic Properties";

- the Louisiana Submerged Cultural Resource Management Plan published by the Division of Archaeology in 1990.

The study will be conducted in three phases: Review of Background Sources, Fieldwork, and Data Analyses and Report Preparation.

a. Phase 1: Literature Search and Records Review. The Contractor shall commence, upon work item award, with a literature, map, and records review specific to the study area. This phase shall include a review and synthesis of the archeological, historical and geomorphologic reports covering the study area. The National Register of Historic Places and the State Archeologist's site, standing structure and shipwreck database files will be consulted to establish a current and complete distribution of historic properties in the vicinity of the study area. At a minimum, the background research and records review will be sufficient for developing the historic context of the study area and should be to a level sufficient for assessing the significance of any sites recorded as a result of the field investigations. A detailed chain of title for the study area is not required for this study.

b. Phase 2: Fieldwork. Upon completion of Phase 1, the contractor shall proceed with execution of fieldwork. This phase will entail both terrestrial and underwater survey; the investigations are to be conducted concurrently.

The pedestrian survey will be conducted within the 35-acre disposal area. Shovel/auger tests in this area are to be excavated at intervals not to exceed 50 meters. Additional shovel tests shall be placed in the higher probability areas along Vermilion River and Anselm Coulee. Additional shovel and/or auger tests will be excavated to further define site boundaries. Maps showing the location of each shovel/auger test along with the project boundaries and other project features are to be drawn to scale and included in the management summary and the draft and final reports. The contractor shall identify and evaluate any standing structures in the project area.

A special effort shall be undertaken to locate the boundaries of the historic cemetery in the disposal area. A magnetometer

and/or other remote sensing methods will be used to identify the cemetery boundary. Shovel testing shall be used in coordination with use of the magnetometer to determine the boundaries of the cemetery. A metal probe will be used to aid in identifying the cemetery boundaries. The contractor shall recommend a buffer around the cemetery to protect it from project impacts. If human remains are encountered during this project the COR will be contacted immediately.

The underwater survey is to be conducted in the Vermilion River from River mile 47.5 to mile 48.4. The equipment array required for the remote sensing portion of the fieldwork will include:

(1) a marine magnetometer
(2) a positioning system
(3) a side-scan sonar system
(4) a fathometer

The following requirements apply to the underwater survey:

(1) transect lane spacing will be at least 50 feet;
(2) positioning control points will be obtained at least every 100 feet along transects;

(4) background noise will not exceed +/- 3 gammas;

(5) magnetic data will be recorded on 100-gamma scale;

(6) the magnetometer sensor will be towed a minimum of 2.5 times the length of the boat or projected in front of the survey vessel to avoid noise from the survey vessel;

(7) the survey will utilize the Louisiana State Plane Coordinate System (NAD 1983); and

(8) additional, more tightly spaced, transects will be run over all potentially significant anomalies.

c. Phase 3: Data Analyses and Report Preparation. All data collected in conjunction with this investigation will be analyzed using currently acceptable scientific methods and will be conducted in accordance with the contractor's proposal. The post-survey data analyses and report presentation covering the underwater survey results will include as a minimum:

(1) post-plots of survey transects and data points;

(2) same as above with magnetic data included;

(3) plan views of all potentially significant anomalies showing transects, data points and contours; and

(4) correlation of magnetic, sonar, and fathometer data, where appropriate.

The interpretation of identified magnetic anomalies will rely on expectations of the character (i.e., signature) of shipwreck magnetics derived from the available literature. Interpretation of anomalies will also consider probable post-depositional impacts and the potential for natural and modern, i.e., insignificant, sources of anomalies. The Contractor will file state site forms with the Louisiana State Archeologist and cite the resulting state-assigned site numbers in the final report for any anomaly classified as a site.

For coordination purposes, a management summary shall be submitted in advance of the draft and final reports of the investigations. The schedule and guidelines for submitting the management summary are provided discussed in Section 6.

The draft and final reports will present the results and recommendations for terrestrial and underwater investigations. An inventory of all anomalies recorded during the underwater survey, with recommendations for further identification and evaluation procedures will be included as appropriate. The discussions must include justifications for the selection of specific targets for further evaluation. The potential for each target or submerged historic property to contribute to archeological or historical knowledge will be assessed. Thus, the Contractor will classify each anomaly as either potentially eligible for inclusion in the National Register, or not eligible. Sonar images of potentially significant anomalies should be referenced and included in the report.

The contractor shall fully support his recommendations regarding site significance. The report will include a summary table listing all anomalies. At a minimum, the table will include the following information: project name; survey segment/area; magnetic target number; gammas intensity; target coordinates, target size, association, description of sonar data.

Reports are to include an assessment of potential significance and recommendations for further work. Recommendations for equipment and methodology to be employed in future evaluation studies must be discussed in detail. Additional requirements for the management summary, draft, and final reports are contained in Section 6 of this Scope of Services.

5. Reports

a. Management Summary. Three copies of a management summary which presents the results of the fieldwork will be submitted to the COR within 2 weeks of completion of the fieldwork. The report will include discussions, with tables and map illustrations for all terrestrial and underwater site investigations.

Recommendations for further identification and evaluation procedures will be included when appropriate. A map showing, as a minimum, post-plots for track lines, magnetic contours showing contour intervals, fathometric contours, and appropriate project related information used to identify anomaly boundaries and project impacts to potentially significant anomalies will be included.

The COR will review the management summary and provide comments to the contractor within 1 week after the receipt of the management summary.

b. Draft and Final Reports Five copies of a draft report integrating all phases of this investigation will be submitted to the COR for review and comment within 4 weeks after the date of the award. The final report shall follow the format set forth in MIL-STD-847A with the following exceptions: (1) separate, soft, durable, wrap-around covers will be used instead of self covers; (2) page size shall be 8-1/2 x 11 inches with 1-inch margins; (3) the reference format of American Antiquity will be used. Spelling shall be in accordance with the U.S. Government Printing Office Style Manual dated January 1973.

The COR will provide all review comments to the Contractor within 8 weeks after receipt of the draft reports (12 weeks after date of order). Upon receipt of the review comments on the draft report, the Contractor shall incorporate or resolve all comments and submit one preliminary copy of the final report to the COR within 5 weeks (17 weeks after date of order). Upon approval of the preliminary final report by the COR, the Contractor will submit 1 reproducible master copy, 1 copy on floppy diskette, 35 copies of the final report, and all separate appendices to the COR within 20 weeks after date of order. A copy of the Scope of Services shall be bound as an appendix with the Final Report. The Contractor shall also supply a complete listing of all computer files submitted. This listing will include file names, file types, disk number, and file description.

6. Weather Contingencies

The potential for weather-related delays during the underwater survey necessitates provision of one weather contingency day in the delivery order. If the Contractor experiences unusual weather conditions, he will be allowed additional time on the delivery schedule but no cost adjustment. Weather contingencies do not apply to the terrestrial investigations.

7. Attachments

Attachment 1. Map showing the study area

APPENDIX III

STATE OF LOUISIANA SITE FORMS AND STANDING STRUCTURE FORMS

STATE OF LOUISIANA
SITE RECORD FORM

LOCATIONAL DATA

SITE NAME: 16LY94 **STATE SURVEY NO.:**

OTHER SITE DESIGNATIONS: Site 2-1.

SITE LOCATION AND APPROACH: Site 2-1 is located in a cow pasture approximately 0.8 km (0.5 mi) northeast of the confluence of Anselm Coulee and the Vermilion River.

PARISH: Lafayette.

N/A **of Section** 50 **Township** 11S **Range** 4E

USGS QUADRANGLE: Milton, Louisiana 1983.

UTM COORDINATES: Zone 15 N3328420 E590040

GEOGRAPHICAL COORDINATES: 4 50 53.93N 68 17 18.93W

PHYSICAL SETTING

LANDFORM: Site 2-1 is located on a ridge overlooking Anselm Coulee.

GEOMORPHIC PROCESSES: Alluviation and erosion.

ELEVATION AND RELIEF: Site 2-1 lies at an elevation of 6.1 m (20 ft) NGVD; the relief in the vicinity of the site is characterized by a gentle downsloping trend to the incised coulee.

NEAREST WATER: Anselm Coulee is located approximately 150 m (492 ft) west of the site.

POSITION WITH RESPECT TO TERRAIN: Site 2-1 is situated at the top of a ridge overlooking Anselm Coulee.

SOIL CHARACTERISTICS: 50 % Coteau Silt loam and 50 % Frost Silt Loam.

FLORAL COMMUNITIES: Hardwoods, grass.

FAUNAL COMMUNITIES: Bovine.

NEAREST KNOWN SITE: 16LY23 is located .6 km (.4 mi) to the north of Site 2-1

SITE DESCRIPTION

SITE DESCRIPTION: Site 2-1 is located in a cow pasture in Section 50, Township 11S, Range 4E. It occupies a ridge that overlooks the Vermilion River, at an elevation of 6.1 m (20 ft) NGVD. Site 2-1 is ovoid in configuration and it encompasses an area that measures 3.0 ac (1.2 ha) in size. It is bounded to the north by a farm complex, and to the east, south, and west by additional pasture. Anselm Coulee lies approximately 150 m (492 ft) to the west of Site 2-1. A total of 44 historic period artifacts, including 15 ceramic sherds, 13 glass shards, 6 brick fragments, and 10 metal objects, were recovered from the site area. [Continued]

SITE SIZE: 3.0 ac (1.2ha).

CONFIGURATION: Ovoid.

DENSITY OF CULTURAL MATERIALS: Light to moderate.

DEPTH OF DEPOSIT/STRATIGRAPHY: A typical shovel test at Site A4-1 was excavated to a depth of 50 cmbs (19.7 inbs) and exhibited two strata in profile. Stratum I consisted of a layer of 10YR 5/2 grayish brown silty loam that extended from 0 - 25 cmbs (0 - 9.8 inbs). This stratum consisted of plowzone before the area was turned to pasture. It was underlain by Stratum II, a layer of 10YR 4/2 dark grayish brown silty clay loam that extended from 25 - 50 cmbs (0 - 19.7 inbs). Material culture was recovered from positive shovel tests at depths ranging from 0 - 50 cmbs (19.7 inbs).

FEATURES: A noticeable square-shaped rise in the ground was observed in the vicinity of ST N1015 E1000, and may represent the remains of a fenced in area, or structural foundation.

DATING/CULTURAL AFFILIATION: Late nineteenth to early twentieth century.

PRESENT CONDITION/PRESERVATION: Site 2-1 is partially disturbed .

PRESENT USE: Cow pasture.

PRESENT AND FUTURE IMPACTS: In past years, Site 2-1 has been plowed for cultivation. Future impacts include dredge spoil dumping.

COLLECTIONS

SURVEY/EXCAVATION METHOD: Pedestrian survey, and systematic shovel testing were employed during archeological testing at Site 2-1.

DESCRIPTION OF MATERIAL: A total of 44 historic period artifacts, including 15 ceramic sherds, 13 glass shards, 6 brick fragments, and 10 metal objects, were recovered from the site area. The ceramic artifacts consisted of 1 domestic brown stoneware sherd, 1 domestic gray stoneware sherd, 5 ironstone sherds, 1 pearlware sherd, whiteware sherds, and 1 yellowware sherd. The glass material included 1 lamp glass shard, 1 pressed glass shard, 1 machine-made bottle glass shard, 8 unidentified molded technique shards, and 2 unidentified kitchen glass shards. The metal artifacts included 2 construction hardware fragments, 1 stove part, and 7 miscellaneous hardware fragments.

SITE EVALUATION

RESEARCH POTENTIAL: Site 2-1 exhibits some integrity and research potential.

STATE OR NATIONAL REGISTER ELIGIBILITY: Potentially significant.

RECOMMENDATIONS: Additional testing is recommended if Site 2-1 is to be impacted by dredge spoil dumping.

RECORDS

OWNER/TENANT AND ADDRESS: Victoria Bourque (owner), Savoy Rd., Milton, La.

INFORMANTS: Victoria Bourque.

PREVIOUS INVESTIGATIONS: None.

COLLECTIONS AND AVAILABILITY: To be curated with the Louisiana Department of Culture, Recreation, and Tourism, Office of Cultural Development, Division of Archaeology, Baton Rouge, Louisiana upon completion of the project.

PHOTOGRAPHS AND MAPS: To be curated with the Louisiana Department of Culture, Recreation, and Tourism, Office of Cultural Development, Division of Archaeology, Baton Rouge, Louisiana upon completion of the project.

REFERENCES:

Robblee, Patrick P. et al.
in prep *Phase I Cultural Resources Survey and Assessment of the Vermilion River Dredge Maintenance Project.* To be submitted to the Louisiana Department of Culture, Recreation, and Tourism, Office of Cultural Development, Division of Archeology, Baton Rouge, Louisiana upon completion of the project.

RECORDED BY: Michael Godzinski, M.A.
Archeologist
R. Christopher Goodwin & Associates, Inc.

DATE: April 23, 1998

STATE OF LOUISIANA
CONTINUATION FORM

Site Name 2-1 **Site Survey Number**_____

A total of 89 of 102 planned shovel tests were excavated successfully in the vicinity of Site 2-1; three shovel tests were not excavated since they fell within the adjacent farm complex, and 10 shovel tests were not excavated because they fell outside the defined limits of the project area. A total of 17 shovel tests produced cultural material. This material is summarized in Table 4. The highest concentration of artifacts and brick fragments occurred in the southern section of the site area; a total of 17 of the 44 artifacts recovered from the site originated from the six shovel tests excavated in this area. This subassemblege represents nearly 39 percent of the total artifact inventory recovered from the site. The oldest diagnostic artifacts at the site were recovered from a buried Stratum II in this area; a scalloped rim, impressed curved lines whiteware sherd (ca. 1820 - 1845), and a mold decorated ironstone sherd (ca. 1840 - 1900) were collected a this locus.

A level, square-shaped mound, or rise, in the terrain also was observed in the vicinity of Shovel Test N1015/E1000; it also represent the remains of a structure at Site 2-1. This area may belie a foundation or it may represent the remains of an enclosed area that has not been trampled by grazing cattle. Brick fragments were recovered from this area. While brick fragments were observed scattered throughout the site area, no intact architectural features were identified at the site. A local informant, Ms. Victoria Bourque, reported that 3 historic residential dwellings were once located on the hilltop on her property (Bourque 1998, personal communication). Ms. Bourque did not know when these houses were constructed or demolished. The predominantly domestic nature of the cultural material recovered both within the artifact and brick concentration and throughout the site area, e.g., ceramics and glass, confirmed that this structure may have been a residential dwelling. One of the purported structures was referred to as having been in the trees near ST N1030 E1060. Shovel testing in the area that Ms. Bourque identified as the location of one of the historic dwellings, i.e. STN1030 E1060 and ST N1030 E1045, revealed brick fragments in Stratum II. Given that the hardwoods in the area of this shovel test were very old, this may be an area that was never disturbed as our shovel tests suggested. In this case, oral testimony corroburated the archeological evidence. At this preliminary evaluation, Site 2-1 is an area which necessitates more study.

A typical shovel test at Site 2-1 was excavated to a depth of 50 cmbs (19.7 inbs), and exhibited two strata in profile. Stratum I consisted of a layer of 10YR 5/2 grayish brown silty loam that extended from 0 - 25 cmbs (0 - 9.8 inbs). It was underlain by Stratum II, a layer of 10YR 4/2 dark grayish brown silty clay loam that extended from 25 - 50 cmbs (0 - 19.7 inbs). Stratum I appeared to consist of plowzone. This interpretation was confirmed by Ms. Bourque, who reported that the project parcel has been cultivated during her lifetime. Cultural material was recovered from positive shovel tests at depths ranging from 0 - 50 cmbs (19.7 inbs) at the site. While a majority of this material originated from Stratum I, i.e. from within the plowzone, a total of 6 artifacts were collected from Stratum II. Miscellaneous brick fragments were also observed in Stratum II. These results suggested that more intact cultural deposits may be present at the site. While the density of subplowzone material observed at Site 2-1 is low, the presence of artifacts below the disturbed surface layer suggest that the site may possess stratigraphic integrity. Further testing and historical research is necessary to properly designate significance.

Data recovered from Site 2-1 suggested that this locale may represent the remains of an early nineteenth to early twentieth century domestic dwelling with an associated artifact scatter. While much of the site has been impacted by plowing, evidence of intact cultural deposits was recovered at the site. A total of six artifacts were recovered at Site 2-1 from sub-plowzone contexts. Additionally, many brick fragments were also observed in this context. Additional testing at the site may produce significant new data on nineteenth to twentieth century farmsteads in Lafayette Parish, Louisiana. A preliminary review of previous investigations completed in the vicinity of this area revealed that no similar historic period sites have been investigated in the project region. Additional circumstantial support for the presence of an historic homesite at this location is the presence of the nearby Picard Cemetery . This cemetery dates to at least the 1860's. Preliminary information suggests that this burial area was devoted primarily to African-Americans. While it is not clear that the earliest interments at the cemetery are of African-Americans, the later burials clearly represent this ethnic minority. Since African-Americans were buried at that cemetery, it is possible that some of these individuals were associated with the nearby farmstead. A research theme identified for Management Unit 3 in Louisiana's Comprehensive Archaeological Plan is the identification of Ethnic Enclaves. If historical research points to an African-American occupation on this property, then research at this site could provide data to address a major theme identified for the region. The preliminary archeological data indicate the possible presence of an historic farmstead at this location. Additional research into the specific history of this property is necessary to make a formal determination of potential significance. If research demonstrates the presence of a documented historic farmstead at this locale, the presence of intact subsurface deposits may provide data regarding patterns of behavior of the residents of this house site. Prior to conducting for additional arguments supporting these recommendations, refer to the discussion of Site 6-1.

Site No. 16LY94

CAD CODING SHEET

Landform (1 Entry)

kn	Knoll	**sd**	Saltdome	**bea**	Beach	**nrs**	Nat. Relic Scar
~~**rid**~~	~~Ridge~~	**swa**	Swamp	**udw**	Underwater	**bat**	Batture
bn	Bench	**bsw**	Backswamp	**nal**	Natural Levee	**ot**	Other, see form
pm	Pimple Mound	**msh**	Marsh	**chr**	Chenier		

Soil Area (1 Entry)

cp	Coastal Plain	**fw**	Flatwoods	~~**ral**~~	~~Recent Alluvium~~	~~**cpr**~~	~~Coastal Prairies~~
cmr	Coastal Marsh	**mtl**	Miss. Terrace, Loessial Hills				

Soil Series Number _____

Cultural Features (4 Entries)

sar	Single Artifact	**psc**	Prehistoric Scatter	**ls**	Lithic Scatter
md1	Mound/Earthwork	~~**hsc**~~	~~Historic Scatter~~	**bu**	Burials
md2	Mounds/Earthwork	**hst**	Hist. Sheet Midden	**ss**	Standing Structures
her	Hist. Earthwork	**shm**	Shell Midden	**du**	Dump
ote	Other Earthwork	**erm**	Earth Midden	**hr**	Historic ruins
sw	Shipwreck				

Remarks (C.F.) _____

Cultural Affiliation (7 Entries)

pu	Prehis. (Unk.)	**tc**	Tchefuncte	**ms**	Mississippian
hu	Historic (Unk.)	**mar**	Marksville	**cad**	Caddo
ph	Pre./Hist. (Unk.)	**is**	Issaquena	**hi**	Hist. Indian Contact
pal	Paleo-Indian	**ba**	Baytown	**ex**	Hist. Explr. 1541-1803
mi	Meso-Indian/Archaic	**tro**	Troyville	~~**ant**~~	~~Antebellum 1803-1860~~
ni	Neo-Indian (Unk.)	**cc**	Coles Creek	~~**war**~~	~~War & Aftrm 1860-1890~~
po	Poverty Point	**pq**	Plaquemine	~~**in**~~	~~Indust. & Modern 1890-~~

Remarks (C.A.) _____

Site Function (3 Entries)

pu	Prehist. (Unk.)	~~**fa**~~	~~Farm/Rural res.~~	**ci**	Commercial/Service
hu	Historic (Unk.)	**wt**	Watercraft P&H	**it**	Institut. (Rel. & Ed.)
ch	Chipping Station	**pt**	Plantation	**gv**	Governmental
cam	Camp	**hs**	Hist. Town/Vill.	**id**	Industrial
el	Extraction Locale	**ur**	Urban	**du**	Dump
ha	Preh. Hamlet/Vill.	**cr**	Cemetery (Mort.)	**ml**	Military
cer	Ceremonial Center	**ht**	Hist. Transport.		

Remarks (S.F.) _____

Description of Material (6 Entries)

cra	Ceramics, Aborig.	**she**	Shell	**wb**	Worked Bone
~~**hc**~~	~~Ceramics, Hist.~~	**ppo**	PPO's	**ub**	Unmodified Bone
cs	Chipped Stone	~~**gl**~~	~~Glass~~	**fl**	Flora
pp	Projectile Pts.	~~**me**~~	~~Metal~~	**wo**	Wood
gs	Ground Stone	~~**cmt**~~	~~Construct. Material (Brick, Wattle & Daub)~~		

Remarks (S.F.)

Method of Investigation at Site (3 Entries)

gra	Grab Surface Col.	**au**	Auger Testing	**rs**	Remote Sensing
sy	Systematic Col.	**tu**	Test Units	**dv**	Diver Investigation
~~**sht**~~	~~Shovel Testing~~	**exc**	Excavation	**obs**	Observed

Disturbance Agent/Present Use (3 Entries)

unk	Unknown	**ti**	Timber Industry	**cw**	Construction, Water
pd	Potted	**nat**	Natural	**cto**	Construction, Other
nn	None	**di**	Urban Develop.	**uw**	Underwater
~~**ag**~~	~~Agricltr (Plowing)~~	**ot**	Other, see site form		

Disturbance Degree (1 Entry)

unk	Unknown	~~**mp**~~	~~Minor Impact~~	**dt**	Destroyed
nn	None	**mj**	Major Impact	**iu**	Inundated

National Register Status (1 Entry)

unk	Unknown	**ld**	Listed	~~**ps**~~	~~Potent. Signif.~~
ne	Not Eligible	**de**	Declared Elig.	**nd**	National Landmark

References (4 Entries)

1)Bourque, Victoria 1998 Pers. Communication

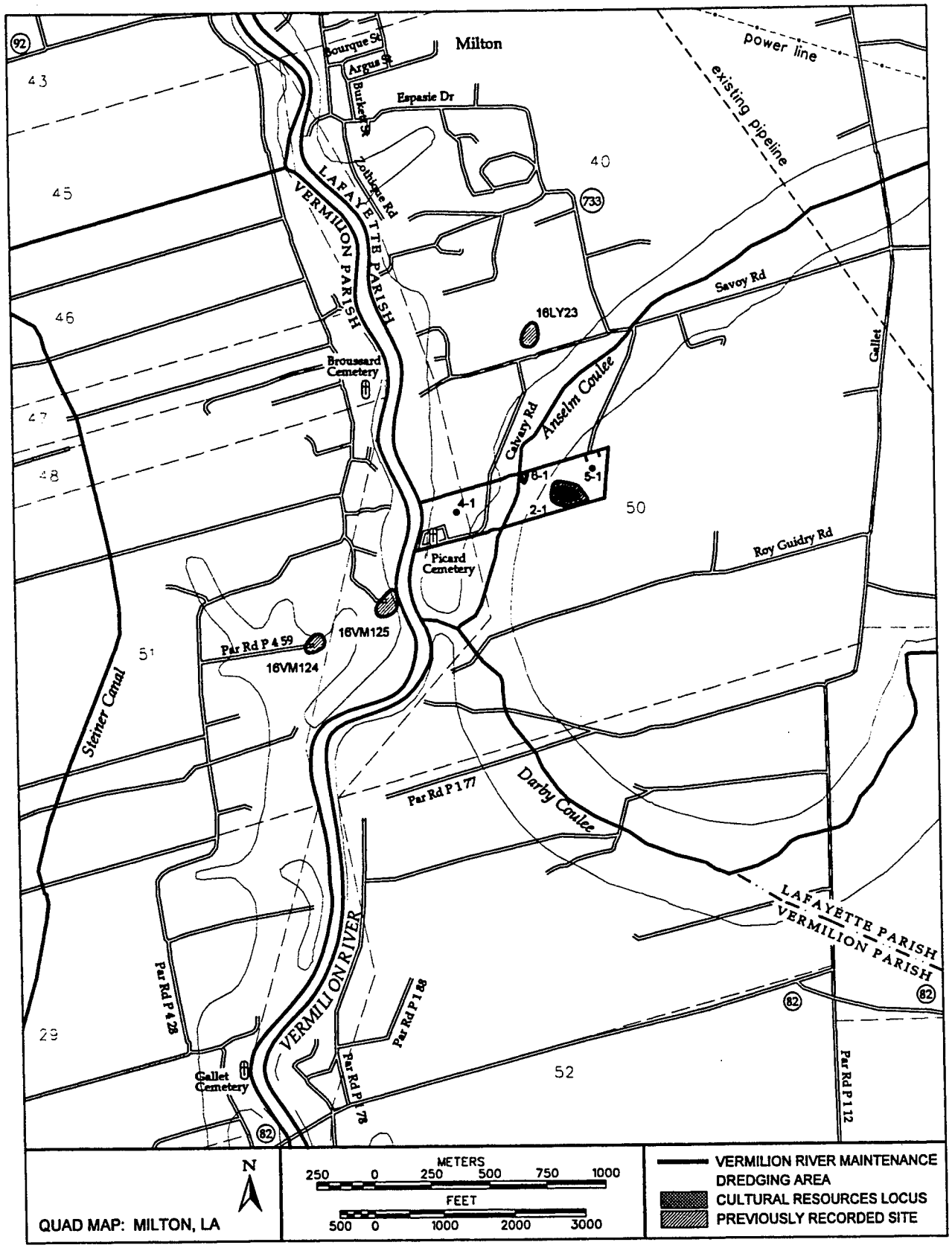
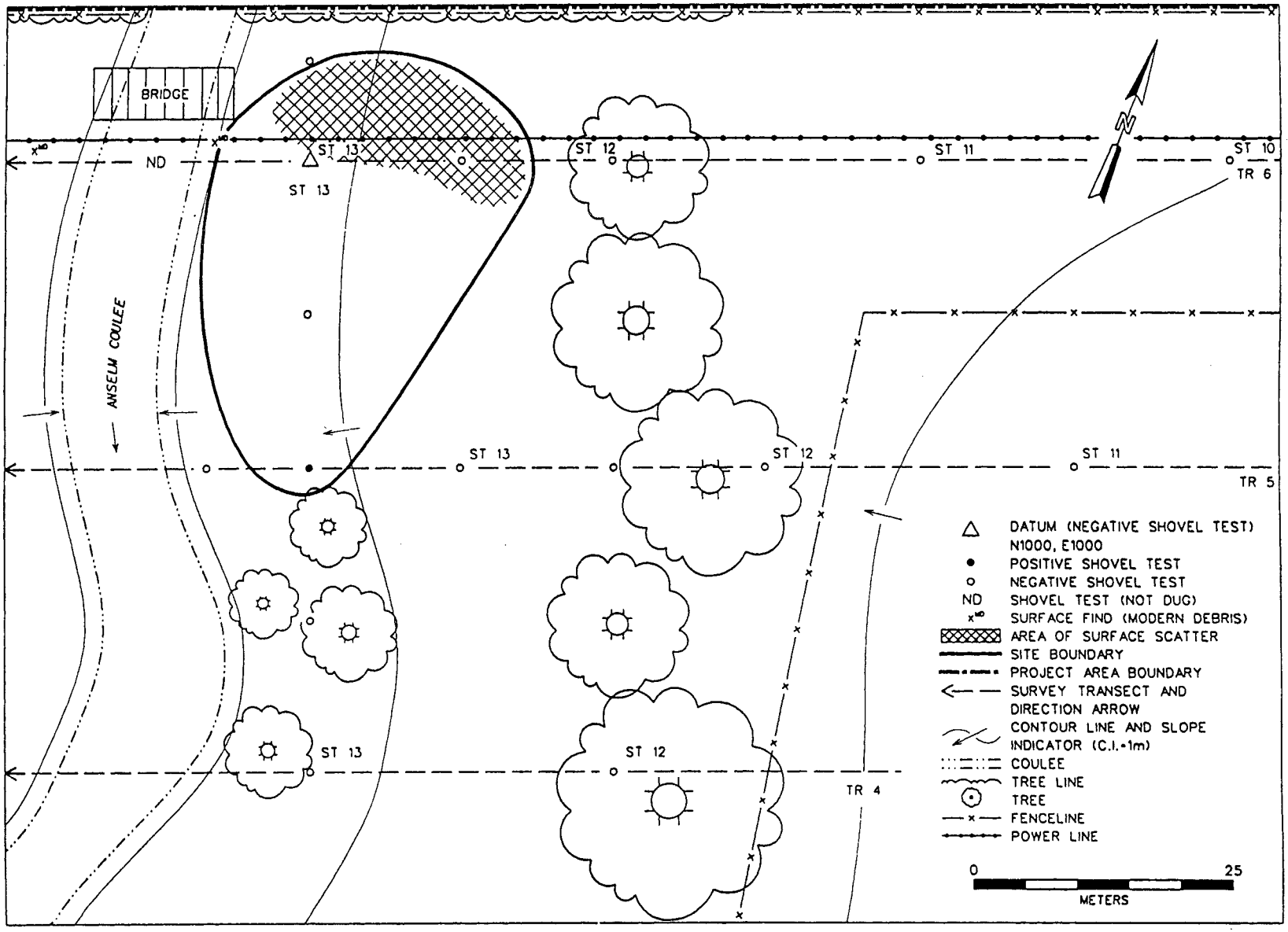

Milton
power line
existing pipeline
Bourque St
Argus St
Burke St
Espasie Dr
Poitevine Rd
LAFAYETTE PARISH
VERMILION PARISH
733
Savoy Rd
16LY23
Broussard Cemetery
Calvary Rd
Anselm Coulee
Gallet
8-1
5-1
4-1
2-1
50
Picard Cemetery
Roy Guidry Rd
16VM125
Par Rd P 459
16VM124
Steiner Canal
51
Par Rd P 177
Darby Coulee
LAFAYETTE PARISH
VERMILION PARISH
VERMILION RIVER
Par Rd P 428
Par Rd P 188
Par Rd P 78
Gallet Cemetery
29
52
Par Rd P 112
92
82
43
45
46
47
48
40
N
QUAD MAP: MILTON, LA
METERS
250 0 250 500 750 1000
FEET
500 0 1000 2000 3000
VERMILION RIVER MAINTENANCE DREDGING AREA
CULTURAL RESOURCES LOCUS
PREVIOUSLY RECORDED SITE

Table 4. Artifacts Recovered from Site 2-1.

CLASS	TYPE	SUBTYPE	GENERAL DATE RANGE	STR	NORTH	EAST	ST#	TOTAL
Ceramic	Domestic Brown Stoneware	Salt-Glazed w/Int. Albany Slip-glazed on Buff-body		I			6	1
	Domestic Brown Stoneware Total							1
	Domestic Gray Stoneware	Lead-glazed		I	1075	970		1
	Domestic Gray Stoneware Total							1
	Ironstone	Mold Decorated	ca. 1840-1900	II	985	1015		1
		Transfer-printed		I	1015	1000		1
		Undecorated White	ca. 1813-1900+; U.P. post ca. 1845	I	970	1000		1
						1060		1
					1015	1000		1
	Ironstone Total							5
	Pearlware	Transfer-printed	ca. 1795-1840	I			8	1
	Pearlware Total							1
	Whiteware	Plain	ca. 1820-1900+	I	1045	1045		2
							5	1
				II	985	1030		1
		Scalloped Rim, impressed curved lines	ca. 1820-1845	II	985	1030		1
		Unscalloped, unmolded	ca. 1850-1897	I	1015	1000		1
	Whiteware Total							6
	Yellowware	Sponged/Spatter Decorated		I	985	1000		1
	Yellowware Total							1
Ceramic Total								15
Construction Materials	Architectural Stone	Brick Fragment(s)		I	970	1030		2
					1030	1060		1
		Brick, Shiner		I	1015	1000		1
					1030	1060		2
	Architectural Stone Total							6
Construction Materials Total								6
Glass	Lamp Glass	Colorless		I	970	1060		1
	Lamp Glass Total							1
	Machine-Made Bottle Glass	Amethyst-colored (Manganese Solarization)	post ca. 1898 (Manu.); post 1916 (U.P.)	II	985	1015		1
	Machine-Made Bottle Glass Total							1
	Pressed Glass	Yellow		I			6	1
	Pressed Glass Total							1
	Unid. Molded Technique	Dark Green		I	970	1000		2
					1045	1045		1
		Light Aqua		I	985	1000		1
				II	985	1015		1
		Yellow Green (Olive)		I	970	1030		1
					1015	1000		2
	Unid. Molded Technique Total							8
	Unidentified Glass shard(s) (Kitchen)	Colorless		I	970	1030		1
		Light Aqua		I	970	1000		1
	Unidentified Glass shard(s) (Kitchen) Total							2
Glass Total								13
Metal	Construction Hardware	Bolt(s) and/or Bracket(s)		II	985	1015		1

Table 4, continued

CLASS	TYPE	SUBTYPE	GENERAL DATE RANGE	STR	NORTH	EAST	ST#	TOTAL
Metal		Spike(s)		I	970	1030		1
	Construction Hardware Total							2
	Furniture	Stove Part(s)		I	1015	1000		1
	Furniture Total							1
	Miscellaneous Hardware	Barbed Wire fragment(s)		I			10	7
	Miscellaneous Hardware Total							7
Metal Total								10
Grand Total								44


BRIDGE
ANSELM COULEE
ND
ST 13
ST 12
ST 11
ST 10
TR 6
TR 5
TR 4
DATUM (NEGATIVE SHOVEL TEST) N1000, E1000
POSITIVE SHOVEL TEST
NEGATIVE SHOVEL TEST
SHOVEL TEST (NOT DUG)
SURFACE FIND (MODERN DEBRIS)
AREA OF SURFACE SCATTER
SITE BOUNDARY
PROJECT AREA BOUNDARY
SURVEY TRANSECT AND DIRECTION ARROW
CONTOUR LINE AND SLOPE INDICATOR (C.I.=1m)
COULEE
TREE LINE
TREE
FENCELINE
POWER LINE
0
25
METERS

STATE OF LOUISIANA
SITE RECORD FORM

LOCATIONAL DATA

SITE NAME: 16LY95 **STATE SURVEY NO.:**

OTHER SITE DESIGNATIONS:. Site 6-1

SITE LOCATION AND APPROACH: Site 6-1 is located in a cow pasture on Anselm Coulee approximately 780 m (2559.1 ft) northeast of the confluence of Anselm Coulee and the Vermilion River.

PARISH:. Lafayette Parish

N/A **of Section** 50 **Township** 11S **Range** 4E

USGS QUADRANGLE:. Milton, Louisiana 1983.

UTM COORDINATES: Zone 15 E 589900 N3328530

GEOGRAPHICAL COORDINATES: 92 4 2.15W 30 5 11.38N

PHYSICAL SETTING

LANDFORM:. Site 6-1 is located on the edge of the incision of Anselm Coulee.

GEOMORPHIC PROCESSES:. Alluviation and erosion

ELEVATION AND RELIEF: Site 6-1 lies at an elevation of 1.5 m (5 ft) NGVD; the relief in the vicinity of the site is minor.

NEAREST WATER:. Site 6-1 is located on the eastern edge of Anselm Coulee. The Vermilion River is located approximately 450 m (1476.4 ft) to the west.

POSITION WITH RESPECT TO TERRAIN: Site 6-1 is located on the floodplain of Anselm Coulee at the base of a gentle slope.

SOIL CHARACTERISTICS:. Frost Silt Loam

FLORAL COMMUNITIES: Grass, Oak, and various hardwoods.

FAUNAL COMMUNITIES: Cows

NEAREST KNOWN SITE: Site 16VM125 is located approximately 800 m (2624.7 ft) southwest.

SITE DESCRIPTION

SITE DESCRIPTION: Site 6-1 is located in a cow pasture in Section 50, Township 11S, Range 4E. It occupies the floodplain of Anselm Coulee at the base of a gentle slope and it lies at an elevation of 1.5 m (5 ft) NGVD. Site 6-1 is ovoid in configuration and it encompasses an area measuring 0.2 ac (0.08 ha) in size. It is bounded to the west by Anselm Coulee, to the north by a mixed hardwood forest, and to the east and south by additional pasture. A total of 142 historic period artifacts, including 52 ceramic sherds, 1 brick fragment, 62 glass shards, and 27 metal objects, were recovered from the site. [Continued]

SITE SIZE: 0.2 ac (0.08 ha).

CONFIGURATION: Ovoid

DENSITY OF CULTURAL MATERIALS: High.

DEPTH OF DEPOSIT/STRATIGRAPHY:. A typical shovel test at Site 6-1 was excavated to a depth of 50 cmbs (19.7 inbs) and exhibited two strata in profile. Stratum I consisted of a layer of 10YR 5/2 grayish brown silty clay loam that extended from 0 - 25 cmbs (0 - 9.8 inbs). This stratum consisted of plowzone. It was underlain by Stratum II, a layer of 10YR 4/2 dark grayish brown silty clay; it reached from 25 - 50 cmbs (9.8 - 19.7 inbs). Material culture both was collected from the surface of the site and recovered from a single positive shovel test at depths ranging from 0 - 20 cmbs (0 - 7.9 inbs).

FEATURES: A light scatter of historic artifacts was observed in the northern corner of the site. One positive shovel test produced approximately 115 artifacts. The site may be a dump site.

DATING/CULTURAL AFFILIATION: Nineteenth to twentieth century.

PRESENT CONDITION/PRESERVATION:. Site 6-1 is partially intact.

PRESENT USE: Cow pasture.

PRESENT AND FUTURE IMPACTS: Site 6-1 is located next to a modern dumping area and exhibits erosional features. Known future impacts include dumping of dredge from the Vermilion River.

COLLECTIONS

SURVEY/EXCAVATION METHOD: Pedestrian survey, systematic shovel testing, and systematic surface collecting. Surface material culture was recovered from within a 5 m (16.4 ft) radius of each excavated shovel test.

DESCRIPTION OF MATERIAL: A total of 142 historic period artifacts, including 52 ceramic sherds, 62 glass shards, 1 brick fragment, and 27 metal objects, were recovered from Site 6-1. The ceramic material consisted of 48 domestic brown stoneware sherds, 1 whiteware sherd, and 3 unidentified burned earthenware sherds. The glass material included 3 amethyst-colored cup bottom mold shards, 1 lamp glass shard, 1 amethyst-colored lettered-plate bottle mold shard, 1 milk glass lid liner shard, 4 machine made base shards, 18 machine-made bottle glass shards, 24 unidentified molded technique shards, and 10 unidentified kitchen glass shards.

SITE EVALUATION

RESEARCH POTENTIAL: Site 6-1 exhibits integrity and research potential.

STATE OR NATIONAL REGISTER ELIGIBILITY:. Potentially significant.

RECOMMENDATIONS: Additional testing is recommended if site is to be impacted by dredge spoil dumping.

RECORDS

OWNER/TENANT AND ADDRESS: Victoria Bourque, Savoy Road, Milton, Louisiana.

INFORMANTS: Victoria Bourque.

PREVIOUS INVESTIGATIONS: None.

COLLECTIONS AND AVAILABILITY: To be curated with the Louisiana Department of Culture, Recreation, and Tourism, Office of Cultural Development, Division of Archaeology, Baton Rouge, Louisiana upon completion of the project.

PHOTOGRAPHS AND MAPS: To be curated with the Louisiana Department of Culture, Recreation, and Tourism, Office of Cultural Development, Division of Archaeology, Baton Rouge, Louisiana upon completion of the project.

REFERENCES:

RECORDED BY: Anna Clayton Logan
Archaeologist
R. Christopher Goodwin & Associates, Inc.

DATE: April 23, 1998

STATE OF LOUISIANA
CONTINUATION FORM

Site Name 6-1 **Site Survey Number**_____

A total of 18 shovel tests were excavated in the vicinity of Site 6-1. While four shovel tests fell within the site boundary, only one shovel test produced cultural material; it contained a total of 114 artifacts. This material originated from Stratum I, Level 1, 0 - 20 cmbs (0 - 7.9 inbs). Cultural material also was collected from the surface within a 10 m (32.8 ft) radius of each excavated shovel test. This collection resulted in the recovery of an additional 28 artifacts. This material is summarized in Table 5.

Shovel testing at Site 6-1 revealed that a portion of the area had been disturbed by erosion. Near the foot bridge over the coulee, an area of surficial exposure was subject to surface collection. No subsurface deposits were encountered in this area. A typical shovel test excavated in the site vicinity extended to a depth of 50 cmbs (19.7 inbs) and exhibited two strata in profile. Stratum I consisted of a layer of 10YR 5/2 grayish brown silty clay loam that extended from 0 - 25 cmbs (0 - 9.8 inbs). It was underlain by Stratum II, a layer of 10YR 4/2 dark grayish brown silty clay from 25 - 50 cmbs (9.8 - 19.7 inbs). All of the artifacts collected at Site 6-1 originated from either Stratum I or the surface.

Data recovered at Site 6-1 indicated that the site consists of a nineteenth to twentieth century refuse disposal area. According to the local informant, these artifacts were associated with the dwellings purported to have been on the ridge overlooking Anselm Coulee (Bourque 1998 pers. Communication). While only one shovel test contained cultural material, it produced a total of 114 historic/modern artifacts. These results suggest that the subsurface artifact density at Site 6-1 is high. A preliminary review of previous archeological investigations completed in the vicinity of Site 6-1 revealed that no similar sites have been investigated or excavated in the project region. These results suggest that Site 6-1 may retain substantive research potential.

According to *Louisiana's Comprehensive Archaeological Plan* (Smith et al. 1983: 64), major research topics for Management Unit 3 include the development of the frontier town and culture history. The presence of scalloped edge whiteware and transfer-printed pearlware sherds indicate an early nineteenth century date for Site 6-1, and an nineteenth century date has been suggested for Site 2-1 as well. The Vermilion River is the major artery of the city of Lafayette and the nearby town of Milton. these early Acadian frontier settlements had many associated outposts and surrounding farmsteads. the presence of potentially intact deposits at sites 2-1 and 6-1 may provide data regarding an historic outpost of Lafayette. In addition, the early dates of site occupation could provide information for interpreting the culture history of Acadian lifeways along the Vermilion River. Research at these sites also could provide data regarding subsistence activities and settlement patterns on the historic Vermilion. No mention in the Comprehensive Plan is made of the historic settlement patterns along the Vermilion. In fact, no mention is made of the Bayou Vermilion in Smith et al., while settlement patterns and historic developments along the Bayou Teche, to the east and north or the current project area, are well studied. What were settlers doing along the Vermilion south of Lafayette when the affluent plantations of the Bayou Teche were constructed and occupied? Additional testing of Sites 2-1 and 6-1 could yield information regarding the lifeways of the common people of Acadiana. Additional research into the specific historic contexts of the project area is necessary prior to making formal determinations of potential eligibility for sites 2-1 and 6-1. The presence of potentially intact deposits at both sites, however, suggests that a tentative recommendation of potentially significant, applying the criteria of eligibility for the National Register of Historic Places (36 CFR 60.4[a and d][), should be offered. Additional testing or avoidance of sites 2-1 and 6-1 is recommended at this time and pending further historic investigation.

Site No. 16LY95

CAD CODING SHEET

Landform (1 Entry)

kn	Knoll	**sd**	Saltdome	**bea**	Beach	**nrs**	Nat. Relic Scar
rid	Ridge	**swa**	Swamp	**udw**	Underwater	**bat**	Batture
bn	Bench	**bsw**	Backswamp	**nal**	Natural Levee	~~**ot**~~	~~Other, see form~~
pm	Pimple Mound	**msh**	Marsh	**chr**	Chenier		

Soil Area (1 Entry)

cp	Coastal Plain	**fw**	Flatwoods	**ral**	Recent Alluvium	~~**cpr**~~	~~Coastal Prairies~~
cmr	Coastal Marsh	**mtl**	Miss. Terrace, Loessial Hills				

Soil Series Number _____

Cultural Features (4 Entries)

sar	Single Artifact	**psc**	Prehistoric Scatter	**ls**	Lithic Scatter
md1	Mound/Earthwork	~~**hsc**~~	~~Historic Scatter~~	**bu**	Burials
md2	Mounds/Earthwork	**hst**	Hist. Sheet Midden	**ss**	Standing Structures
her	Hist. Earthwork	**shm**	Shell Midden	~~**du**~~	~~Dump~~
ote	Other Earthwork	**erm**	Earth Midden	**hr**	Historic ruins
sw	Shipwreck				

Remarks (C.F.) _____

Cultural Affiliation (7 Entries)

pu	Prehis. (Unk.)	**tc**	Tchefuncte	**ms**	Mississippian
hu	Historic (Unk.)	**mar**	Marksville	**cad**	Caddo
ph	Pre./Hist. (Unk.)	**is**	Issaquena	**hi**	Hist. Indian Contact
pal	Paleo-Indian	**ba**	Baytown	**ex**	Hist. Explr. 1541-1803
mi	Meso-Indian/Archaic	**tro**	Troyville	~~**ant**~~	~~Antebellum 1803-1860~~
ni	Neo-Indian (Unk.)	**cc**	Coles Creek	~~**war**~~	~~War & Aftrm 1860-1890~~
po	Poverty Point	**pq**	Plaquemine	~~**in**~~	~~Indust. & Modern 1890-~~

Remarks (C.A.) _____

Site Function (3 Entries)

pu	Prehist. (Unk.)	**fa**	Farm/Rural res.	**ci**	Commercial/Service
hu	Historic (Unk.)	**wt**	Watercraft P&H	**it**	Institut. (Rel. & Ed.)
ch	Chipping Station	**pt**	Plantation	**gv**	Governmental
cam	Camp	**hs**	Hist. Town/Vill.	**id**	Industrial
el	Extraction Locale	**ur**	Urban	~~**du**~~	~~Dump~~
ha	Preh. Hamlet/Vill.	**cr**	Cemetery (Mort.)	**ml**	Military
cer	Ceremonial Center	**ht**	Hist. Transport.		

Remarks (S.F.) _____

Description of Material (6 Entries)

cra	Ceramics, Aborig.	**she**	Shell	**wb**	Worked Bone
~~**hc**~~	~~Ceramics, Hist.~~	**ppo**	PPO's	**ub**	Unmodified Bone
cs	Chipped Stone	~~**gl**~~	~~Glass~~	**fl**	Flora
pp	Projectile Pts.	~~**me**~~	~~Metal~~	**wo**	Wood
gs	Ground Stone	~~**cmt**~~	~~Construct. Material~~ (~~Brick~~, Wattle & Daub)		

Remarks (S.F.)

Method of Investigation at Site (3 Entries)

gra	Grab Surface Col.	**au**	Auger Testing	**rs**	Remote Sensing
~~**sy**~~	~~Systematic Col.~~	**tu**	Test Units	**dv**	Diver Investigation
~~**sht**~~	~~Shovel Testing~~	**exc**	Excavation	**obs**	Observed

Disturbance Agent/Present Use (3 Entries)

unk	Unknown	**ti**	Timber Industry	**cw**	Construction, Water
pd	Potted	~~**nat**~~	~~Natural~~	**cto**	Construction, Other
nn	None	**di**	Urban Develop.	**uw**	Underwater
~~**ag**~~	~~Agricltr (Plowing)~~	**ot**	Other, see site form		

Disturbance Degree (1 Entry)

unk	Unknown	~~**mp**~~	~~Minor Impact~~	**dt**	Destroyed
nn	None	**mj**	Major Impact	**iu**	Inundated

National Register Status (1 Entry)

unk	Unknown	**ld**	Listed	~~**ps**~~	~~Potent. Signif.~~
ne	Not Eligible	**de**	Declared Elig.	**nd**	National Landmark

References (4 Entries)

1) Bourque, Victoria. 1998 Pers. Communication
2) Smith et al. 1983 Louisiana's Comprehensive Archaeological Plan
3) _____
4) _____

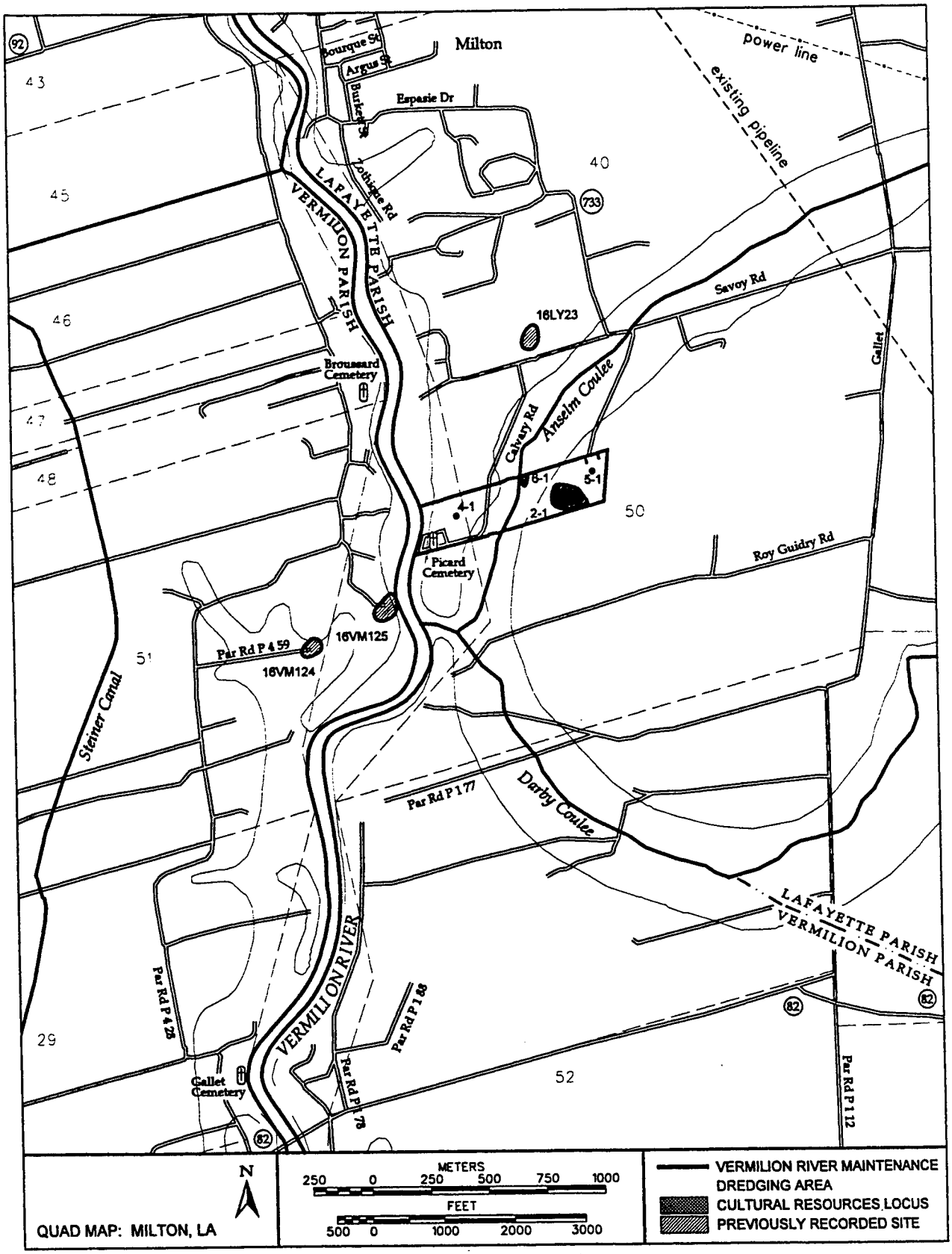
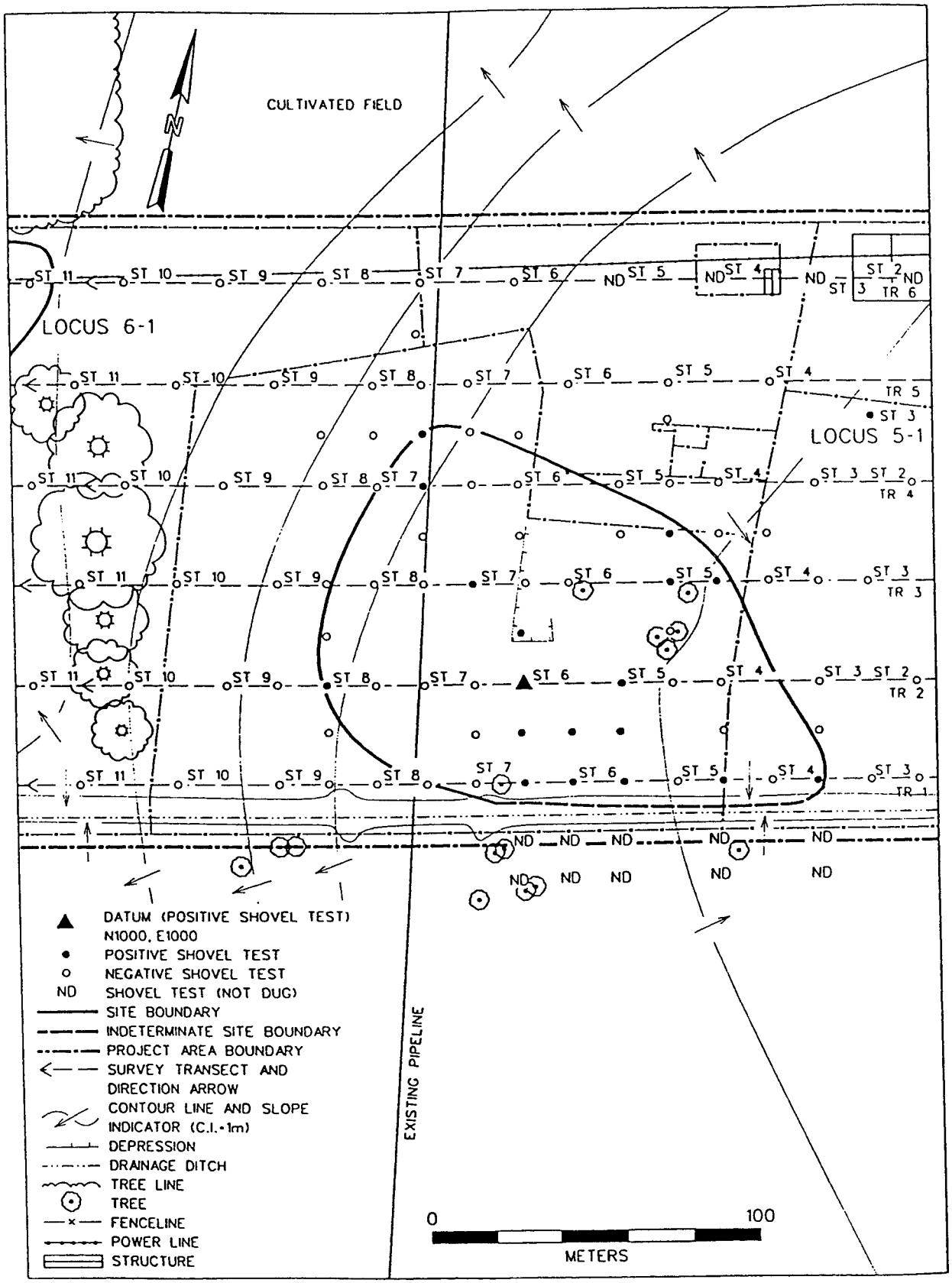

Milton
power line
existing pipeline
Bourque St
Argus St
Burke St
Espasie Dr
Zotique Rd
LAFAYETTE PARISH
VERMILION PARISH
Savoy Rd
16LY23
Broussard Cemetery
Calvary Rd
Anselm Coulee
Gallet
B-1
S-1
A-1
2-1
Picard Cemetery
Roy Guidry Rd
16VM125
16VM124
Par Rd P 459
Steiner Canal
Par Rd P 177
Darby Coulee
VERMILION RIVER
LAFAYETTE PARISH
VERMILION PARISH
Par Rd P 428
Par Rd P 168
Par Rd P 178
Gallet Cemetery
Par Rd P 112
40
43
45
46
47
48
50
51
52
29
92
733
82
N
METERS
250 0 250 500 750 1000
FEET
500 0 1000 2000 3000
QUAD MAP: MILTON, LA
VERMILION RIVER MAINTENANCE DREDGING AREA
CULTURAL RESOURCES LOCUS
PREVIOUSLY RECORDED SITE

Table 5. Artifacts Recovered from Site 6-1.

CLASS	TYPE	SUBTYPE	GENERAL DATE RANGE	TOTAL
Ceramic	Domestic Brown Stoneware	Opaque Glaze on Buff		5
		Opaque Glaze w/Int. Albany Slip-glaze on Buff		5
		Salt-glazed w/Int. Lead Glaze on Buff		37
		Sponge/Spatter on Buff		1
	Unidentified Ceramics	Unidentified Burned Earthenware		3
	Whiteware	Flow Blue	ca. 1840-1870+	1
Ceramic Total				**52**
Construction Materials	Architectural Stone	Brick Fragment(s)		1
Construction Materials Total				**1**
Glass	Cup Bottom Mold	Amethyst-colored (Manganese Solarization)	ca. 1875-1920	3
	Lamp Glass	Colorless		1
	Lettered-plate Bottle Mold	Amethyst-colored (Manganese Solarization)	ca. 1875-1920	1
	Lid Liner	Opaque White / Milk Glass	post ca. 1869	1
	Machine-Made Base	Amethyst-colored (Manganese Solarization)	post ca. 1898 (Manu.); post 1916 (U.P.)	1
		Colorless	post ca. 1898 (Manu.); post 1916 (U.P.)	3
	Machine-Made Bottle Glass	Amber	post ca. 1898 (Manu.); post 1916 (U.P.)	2
		Amethyst-colored (Manganese Solarization)	post ca. 1898 (Manu.); post 1916 (U.P.)	1
		Aqua	post ca. 1898 (Manu.); post 1916 (U.P.)	1
		Colorless	post ca. 1898 (Manu.); post 1916 (U.P.)	13
		Green	post ca. 1898 (Manu.); post 1916 (U.P.)	1
	Unid. Molded Technique	Amethyst-colored (Manganese Solarization)	ca. 1875-1920	2
		Aqua		2
		Cobalt Blue		1
		Colorless		15
		Green		4
	Unidentified Glass shard(s) (Kitchen)	Amber		3
		Amethyst-colored (Manganese Solarization)	ca. 1875-1920	2
		Colorless		4
		Light Aqua		1
Glass Total				**62**
Metal	Miscellaneous Hardware	Barbed Wire fragment(s)		3
	Nail(s), Iron	Wire, Unidentified	post ca. 1890	1
	Storage Items	Iron Can(s)		5
	Unidentified Metal	Cast Iron		9
		Iron/Steel		9
Metal Total				**27**
Grand Total				**142**


CULTIVATED FIELD
N
LOCUS 6-1
LOCUS 5-1
ST 11
ST 10
ST 9
ST 8
ST 7
ST 6
ST 5
ST 4
ST 3
ST 2
TR 1
TR 2
TR 3
TR 4
TR 5
TR 6
ND
DATUM (POSITIVE SHOVEL TEST) N1000, E1000
POSITIVE SHOVEL TEST
NEGATIVE SHOVEL TEST
SHOVEL TEST (NOT DUG)
SITE BOUNDARY
INDETERMINATE SITE BOUNDARY
PROJECT AREA BOUNDARY
SURVEY TRANSECT AND DIRECTION ARROW
CONTOUR LINE AND SLOPE INDICATOR (C.I.-1m)
DEPRESSION
DRAINAGE DITCH
TREE LINE
TREE
FENCELINE
POWER LINE
STRUCTURE
EXISTING PIPELINE
0
100
METERS

STATE OF LOUISIANA
SITE FORM

LOCATIONAL DATA

SITE NAME: Picard Cemetery.

STATE SURVEY NO.: 16LY97

OTHER DESIGNATIONS: ***

SITE LOCATION AND APPROACH: From the intersection of State Highways 733 and 92 in Milton, Louisiana, proceed east for approximately 0.35 km (0.22 mi) on Highway 92 to Gallet Rd. At this intersection turn to the south/southeast, and continue for approximately 1.4 km (0.87) crossing Anselm Coulee. At the next intersection (Savoy Rd.), turn to the west and proceed towards the Vermilion River. After approximately 1.6 km (1 mi), turn south onto Calvary Rd. and proceed for approximately 1.1 km (0.68 mi). Calvary Rd. road terminates at an unimproved (two-track) road that encompasses the perimeter of Picard Cemetery.

PARISH: Lafayette

W 1/2 **of Irregular Section** 50 **Township** 11S **Range** 04E

USGS QUADRANGLE: USGS 7.5' Series Topographic Quadrangle, Milton, LA (provisional edition 1983)

UTM COORDINATES: Zone 15 589470E, 3328250N

GEOGRAPHICAL COORDINATES: Long. 92° 04' 18" west, Lat. 30° 05' 02" north

PHYSICAL SETTING

LANDFORM: The cemetery is situated on a Pleistocene ridge terrace overlooking the Vermilion River.

GEOMORPHIC PROCESSES: Pleistocene and Holocene deposition with subsequent Holocene erosion.

ELEVATION AND RELIEF: The elevation is approximately 4.6 m (15 ft) NGVD 1929; the terrain is flat to gently sloping (< 1 to 3 percent).

NEAREST WATER: The Vermillion River is located less than 50 m (164 ft) west of the cemetery.

POSITION WITH RESPECT TO TERRAIN: The cemetery is oriented generally east to west.

SOIL CHARACTERISTICS: Coteau - Frost association; mapped as Coteau silt loam (1 to 3 percent slope).

FLORAL COMMUNITIES: Species typical of the area include oak, hickory, sweetgum, elm, willow, and planted grasses (bahia, bermuda and rye).

FAUNAL COMMUNITIES: Species typical of the area include raccoon, gray squirrel, opossum, cottontail rabbit, a variety of reptile and bird species, and cattle.

NEAREST KNOWN SITE: Site 16VM125 is located approximately 200 m (656 ft) southwest of the cemetery on the opposite bank of the Vermilion River.

SITE DESCRIPTION

SITE DESCRIPTION: The cemetery consists of approximately 343 tombs, some with multiple interments, that date from the historic period and originated during the 1860's.

SITE SIZE: The cemetery encompasses 1.2 ac (0.5 ha) and measures approximately 50 m (164 ft) north-south by 100 m (328 ft) east-west.

CONFIGURATION: The cemetery generally is rectangular in shape.

DENSITY OF CULTURAL MATERIALS: Unknown, no subsurface testing has been conducted.

DEPTH OF DEPOSIT/STRATIGRAPHY: Unknown, no subsurface testing has been conducted.

FEATURES: A total of 343 interment locations, including 23 unmarked infant burials, have been identified at Picard Cemetery. A brick rubble pile (Feature 1) was identified in a shovel test placed within a 15 m (49 ft) buffer zone outside of the north cemetery fence. The feature consisted of a large number of brick fragments with no apparent internal alignment. The bricks appeared to have been deposited in a small pit and likely represent the disposal of trash from a cemetery clean-up effort. Numerous fragments of brick from decaying tombs were observed on the ground surface along the river bank. These were accompanied by bits of plastic flowers and flowerpots.

DATING/CULTURAL AFFILIATION: The cemetery dates from the 1860s and primarily contains the remains of African-Americans. European-Americans also have been interred at this locale.

PRESENT CONDITION/PRESERVATION: The cemetery has been disturbed both by modern activities and natural erosion; currently it is in fair to poor condition. It is not known how many of the burials are intact.

PRESENT USE: The surrounding area is agricultural and it is used for the grazing of cattle.

PRESENT AND FUTURE IMPACTS: Unknown, the cemetery will be avoided during proposed dredge disposal activities.

COLLECTIONS

SURVEY/EXCAVATIONMETHOD: Picard Cemetery appears on the 7.5' Series Topographic Quadrangle, Milton, LA (provisional edition 1983) and information also is on file at the Lafayette Parish Courthouse. On July 5, 1993, members of the Lafayette Genealogical Society recorded information from each of 343 tombs that were visually identified. The most recent fieldwork was conducted in April of 1998 and included pedestrian reconnaissance, remote sensing (magnetometer testing), shovel test excavation, auger test excavation, and probing with a metal probe in a 15 m (49 ft) buffer zone located outside of the north and east cemetery fences. These field methods were designed to ascertain whether the present cemetery fence marks the actual limits of the cemetery.

DESCRIPTION OF MATERIAL: Cultural material was observed but not recovered within the cemetery fence; it consisted of brick, concrete, iron crosses, and other grave markers. Trash from cemetery cleaning episodes was observed but not recovered along the outside of the cemetery fence. A small number of modern artifacts were recovered from a single shovel test placed outside of the north cemetery fence.

SITE EVALUATION

RESEARCH POTENTIAL: Research potential is good; despite previous impacts, the presence of African-American remains dating to the eighteenth century are suggestive of an ethnic enclave in Lafayette Parish.

STATE OR NATIONAL REGISTER ELIGIBILITY: As a cemetery, this locale is not eligible for inclusion in the National Register; however, its state eligibility has not been determined.

RECOMMENDATIONS: Picard Cemetery should be avoided during proposed mechanical activities, and additional efforts should be made to preserve it from any further impacts. Furthermore, legible markings displayed on tombs should be systematically recorded and documented for further research.

RECORDS

OWNER/TENANT AND ADDRESS: Ms. Victoria Bourque ***

INFORMANTS: Ms. Victoria Bourque

PREVIOUS INVESTIGATIONS: Recordation of 343 tombs by the Lafayette Genealogical Society, 1993.

COLLECTIONS AND AVAILABILITY: Following acceptance of the final report, all photographs, maps and magnetometer data related to Picard cemetery will be curated along with other project materials.

PHOTOGRAPHS AND MAPS: Attached and/or included in the field notes.

REFERENCES: Lichtenberger, et al. 1998
Phase I Cultural Resources Survey and Inventory of the Proposed Vermilion River Dredge Maintenance Project Area, Lafayette Parish, Louisiana. Report submitted by R. Christopher Goodwin & Associates, Inc., to the United States Army Corps of Engineers, New Orleans District.

Lafayette Genealogical Society 1993 ***

RECORDED BY: Randy Lichtenberger and Luis M. Williams, Jr.
R. Christopher Goodwin & Associates, Inc.
5824 Plauche Street
New Orleans, LA 70123
Tel. (504) 736-9323

DATE: August 26, 1998

Site No._____

CAD CODING SHEET

Landform (1 Entry)

kn	Knoll	**sd**	Saltdome	**bea**	Beach	**nrs**	Nat. Relic Scar
rid	Ridge	**swa**	Swamp	**udw**	Underwater	**bat**	Batture
bn	Bench	**bsw**	Backswamp	**nal**	Natural Levee	**ot**	Other, see form
pm	Pimple Mound	**msh**	Marsh	**chr**	Chenier		

Soil Area (1 Entry)

cp	Coastal Plain	**fw**	Flatwoods	**ral**	Recent Alluvium	**cpr**	Coastal Prairies
cmr	Coastal Marsh	**mtl**	Miss. Terrace, Loessial Hills				

Soil Series Number 8

Cultural Features (4 Entries)

sar	Single Artifact	**psc**	Prehistoric Scatter	**ls**	Lithic Scatter
md1	Mound/Earthwork	**hsc**	Historic Scatter	**bu**	Burials
md2	Mounds/Earthwork	**hst**	Hist. Sheet Midden	**ss**	Standing Structures
her	Hist. Earthwork	**shm**	Shell Midden	**du**	Dump
ote	Other Earthwork	**erm**	Earth Midden	**hr**	Historic ruins
sw	Shipwreck				

Remarks (C.F.) _____

Cultural Affiliation (7 Entries)

pu	Prehis. (Unk.)	**tc**	Tchefuncte	**ms**	Mississippian
hu	Historic (Unk.)	**mar**	Marksville	**cad**	Caddo
ph	Pre./Hist. (Unk.)	**is**	Issaquena	**hi**	Hist. Indian Contact
pal	Paleo-Indian	**ba**	Baytown	**ex**	Hist. Explr. 1541-1803
mi	Meso-Indian/Archaic	**tro**	Troyville	**ant**	Antebellum 1803-1860
ni	Neo-Indian (Unk.)	**cc**	Coles Creek	**war**	War & Aftrm 1860-1890
po	Poverty Point	**pq**	Plaquemine	**in**	Indust. & Modern 1890-

Remarks (C.A.) The cemetery dates from the 1860s.

Site Function (3 Entries)

pu	Prehist. (Unk.)	**fa**	Farm/Rural res.	**ci**	Commercial/Service
Cen.					
hu	Historic (Unk.)	**wt**	Watercraft P&H	**it**	Institut. (Rel. & Ed.)
ch	Chipping Station	**pt**	Plantation	**gv**	Governmental
cam	Camp	**hs**	Hist. Town/Vill.	**id**	Industrial
el	Extraction Locale	**ur**	Urban	**du**	Dump
ha	Preh. Hamlet/Vill.	**cr**	Cemetery (Mort.)	**ml**	Military
cer	Ceremonial Center	**ht**	Hist. Transport.		

Remarks (S.F.) _____

Description of Material (6 Entries)

cra	Ceramics, Aborig.	**she**	Shell	**wb**	Worked Bone
hc	Ceramics, Hist.	**ppo**	PPO's	**ub**	Unmodified Bone
(Fauna)					
cs	Chipped Stone	**gl**	Glass	**fl**	Flora
pp	Projectile Pts.	**me**	Metal	**wo**	Wood
gs	Ground Stone	**cmt**	Construct. Material (Brick, Wattle & Daub)		

Method of Investigation at Site (3 Entries)

gra	Grab Surface Col.	**au**	Auger Testing	**rs**	Remote Sensing
sy	Systematic Col.	**tu**	Test Units	**dv**	Diver Investigation
sht	Shovel Testing	**exc**	Excavation		

Disturbance Agent/Present Use (3 Entries)

unk	Unknown	**ti**	Timber Industry	**cw**	Construction, Water
pd	Potted	**nat**	Natural	**cto**	Construction, Other
nn	None	**di**	Urban Develop.	**uw**	Underwater
ag	Agricltr (Plowing)	**ot**	Other, see site form		

Disturbance Degree (1 Entry)

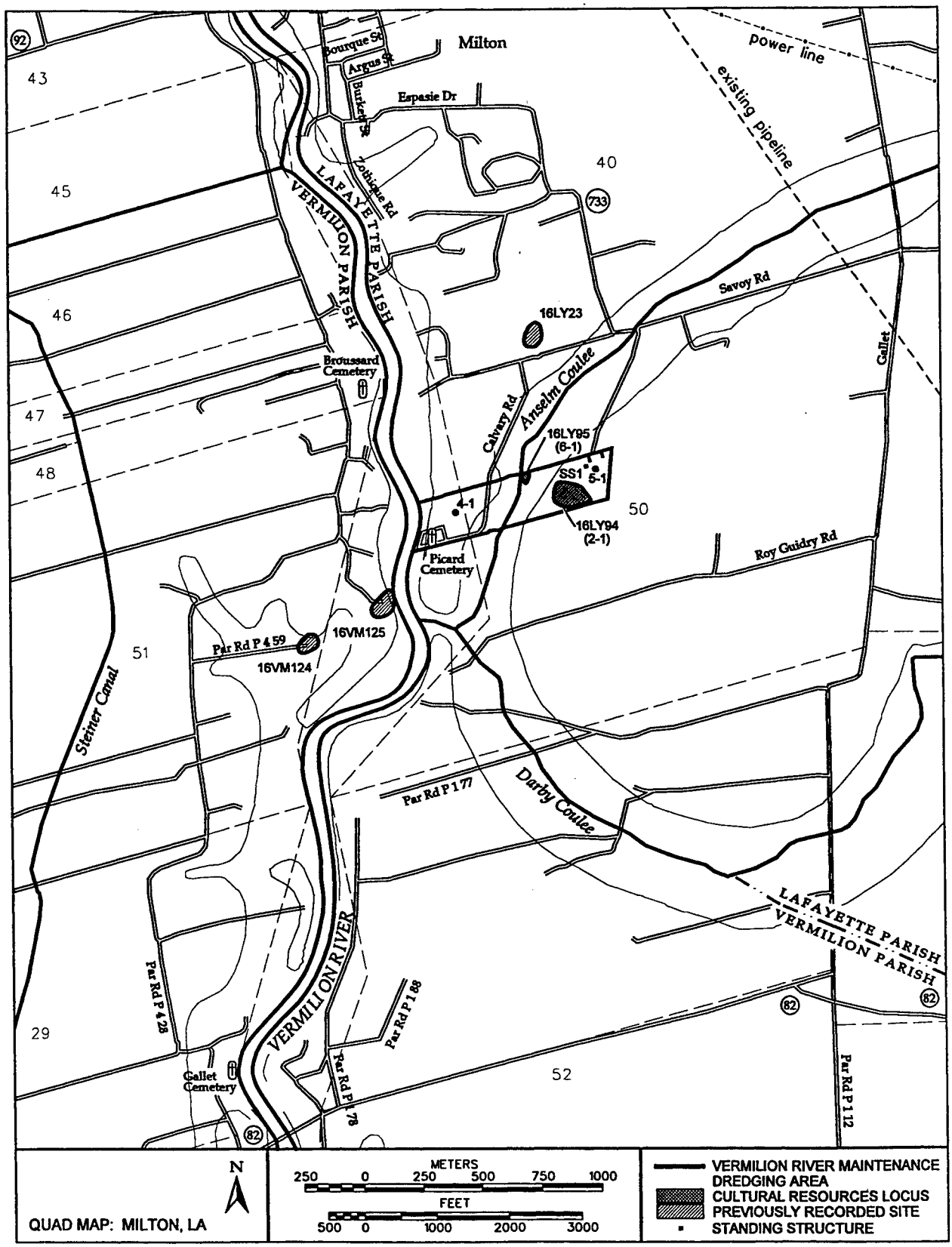
unk	Unknown	**mp**	Minor Impact	**dt**	Destroyed
nn	None	**mj**	Major Impact	**iu**	Inundated

National Register Status (1 Entry)

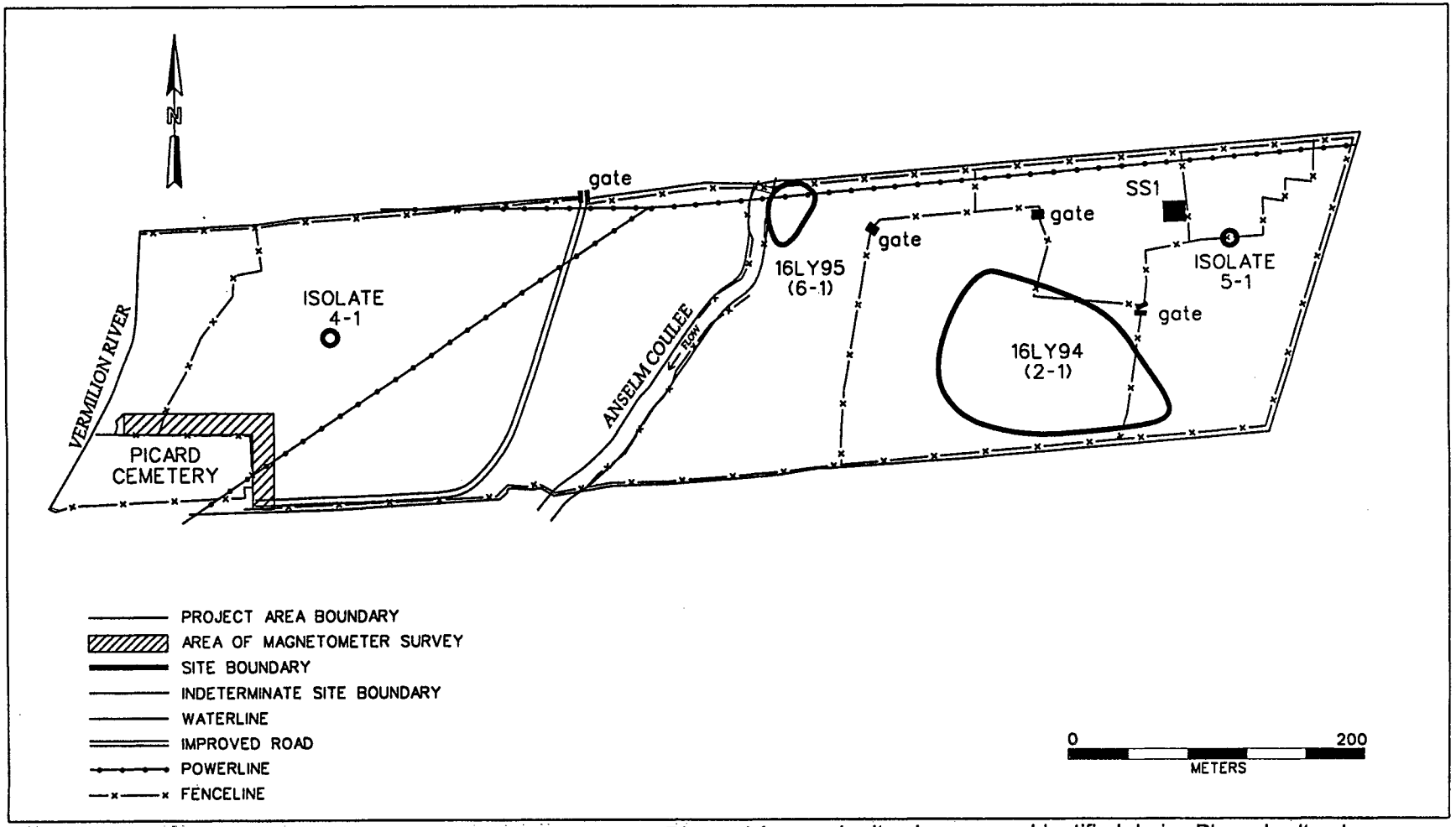
unk	Unknown	**ld**	Listed	**ps**	Potent. Signif.
ne	Not Eligible	**de**	Declared Elig.	**nd**	National Landmark

References (4 Entries)

1) Lichtenberger, et al. 1998 2)_____ 3)_____ 4) _____



Excerpt from the 1996 digital 7.5' series topographic quadrangle, Milton, Louisiana, depicting the proposed Vermilion River Maintenance Disposal Area, and cultural resources identified during Phase I cultural resources survey and inventory.



Overview map depicting the proposed Vermilion River Maintenance Disposal Area and cultural resources identified during Phase I cultural resources survey and inventory.

Historic Theme & Criterion

HISTORIC STANDING STRUCTURES SURVEY

Louisiana Division of Historic Preservation

P.O. Box 44247 Baton Rouge, LA 70804-4247 (504)342-8160

A. ASSESSMENT

1. LOCATION INFORMATION:

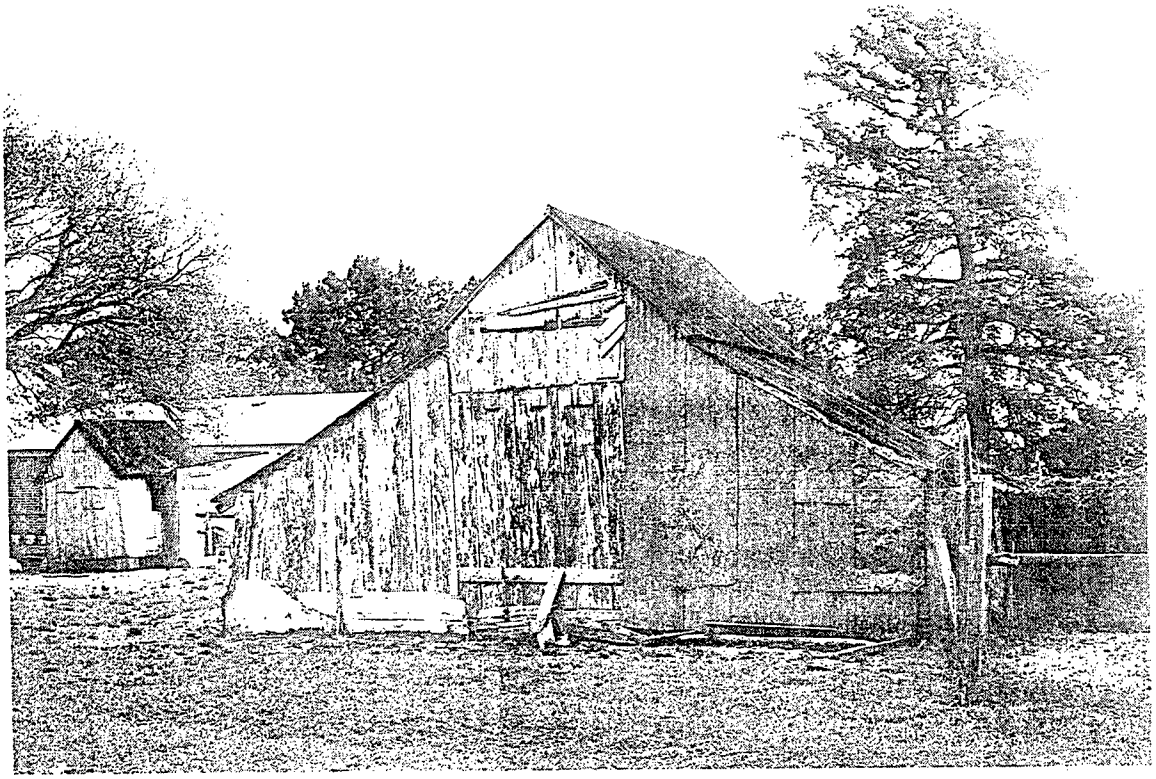
Town/vicinity Youngsville, La Parish No. _____ Site No. SS1

Address Savoy Rd. Parish Lafayette

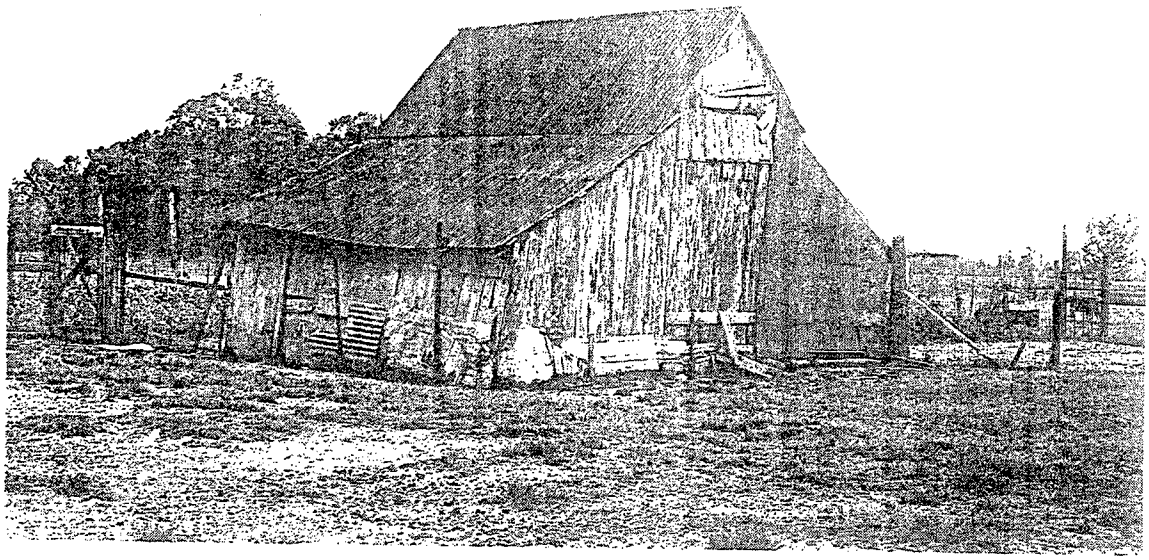
Youngsville - Milton, La.

2. PHOTOGRAPHS

In the space below mount two photos: one of the facade and one of another primary elevation. Any additional photos may be mounted on a separate sheet and attached to this form.



RECORDED BY R. Christopher Goodwin & Associates, Inc. **DATE** 4-16-98



3. TOPOGRAPHIC QUAD:

Name Milton, La.

Sect Sect 50 T11S R4E

Size 7.5 minute

4. OWNERSHIP:

Name Victoria Bourque

Address Savoy Road, Youngsville - Milton, LA

Phone 504 - 856 - 4285

5. HISTORICAL DATA:

Historic Name Unknown

Historic Use Utilitarian farm structure

Original Owner Unknown

Architect/Builder Unknown

6. CONDITION:

Good _____ Fair _____ Deteriorated X

Remarks Resided and roofed with tin

7. INTEGRITY:

Unaltered _____ Minor Alterations _____ Major Alterations X

List Major Alterations Barn had been resided

8. RELATED FEATURES:

Historic Fencing _____ Well/cistern _____ Cemetery _____

Historic Garden/Landscaping _____ Other Modern outbuildings, barn, shed

9. THREATS TO BUILDING OR SITE:

None _____ Development _____ Deterioration _____

Road Construction _____ Vandalism _____ Zoning _____

Other Possible impact due to proposed dredge spoil pumping

10. PRIMARY REFERENCES:

Interview _____

Document _____

Published _____

Works _____

B. PHYSICAL DESCRIPTION:

Describe the structures as completely as possible using the following categories and examples of features as general guidelines. Where applicable, note the location of each feature.

1. CONSTRUCTION/MODIFICATION DATE:

Early 20th century

2. ARCHITECTURAL STYLE:

For example: Greek Revival, Italianate, Queen Anne, Colonial Revival, Bungalow, etc., or combinations and influences thereof

Gable-front barn

3. OVERALL BUILDING SHAPE/MASSING:

Note number of stories, plan shape, bays, wings, etc.

One story, rectangular plan

4. BASIC FLOOR PLAN DESCRIPTION:

For example: shotgun, bungalow, dogtrot, asymmetric, open commercial space, office, gym, etc.

Three Rooms

5. FOUNDATION:

Note type (piers, slab, etc.) and material (wood, masonry, concrete, etc.)

Wooden posts in ground

6. WALL CONSTRUCTION:

For example: log, balloon framing, bousillage, brick, etc.

Simple, over wood-frame

7. EXTERIOR MATERIALS:

For example: clapboard, shingle, stucco, etc.

Vertical, 8 inch cladding

8. ROOF CHARACTERISTICS:

Note shape (gable, hip, shed, etc.) and material (slate,tin, tile, asbestos, etc.)

Spraddle, tin

8A. ROOF FEATURES:

Note dormers, towers, cupolas, parapets, etc.

Steep pitch

8B. ROOF TRIM:

Note cornices, entablature, dentils, vergeboards, brackets, exposed rafters, etc.

None

9. **WINDOWS:**

Note type (casement, double hung, French), panes (6/6, 3/1, 1/1), trim/surrounds, shutters, colored panes, stained glass, etc.

None

10. **DOORS:**

Note type, trim/surrounds, shutters. fanlights, pediments, pilasters, transoms, etc.

Small, swinging door, metal hinges

11. **PORCHES, GALLERIES, AND PORTICOS:**

Note location, material

None

11A. DECORATIVE PORCH/GALLERY/PORTICO FEATURES:

Note columns/posts, capitals, balustrade, spindles, brackets, etc.

None

12. **OTHER DECORATIVE DETAILS:**

For example: patterned shingles, quoins, half-timbering, etc.

None

13. **MAJOR STYLISTIC ELEMENTS/ARTICULATION (if not already described):**

For example: Gothic buttresses, open carriageway, Italianate tower, etc.

None

14. **INTERIOR DETAILS (if accessible):**

Three rooms with rudimentary boards a few inches apart separating interior walls

C. **ARCHITECTURAL SIGNIFICANCE:**

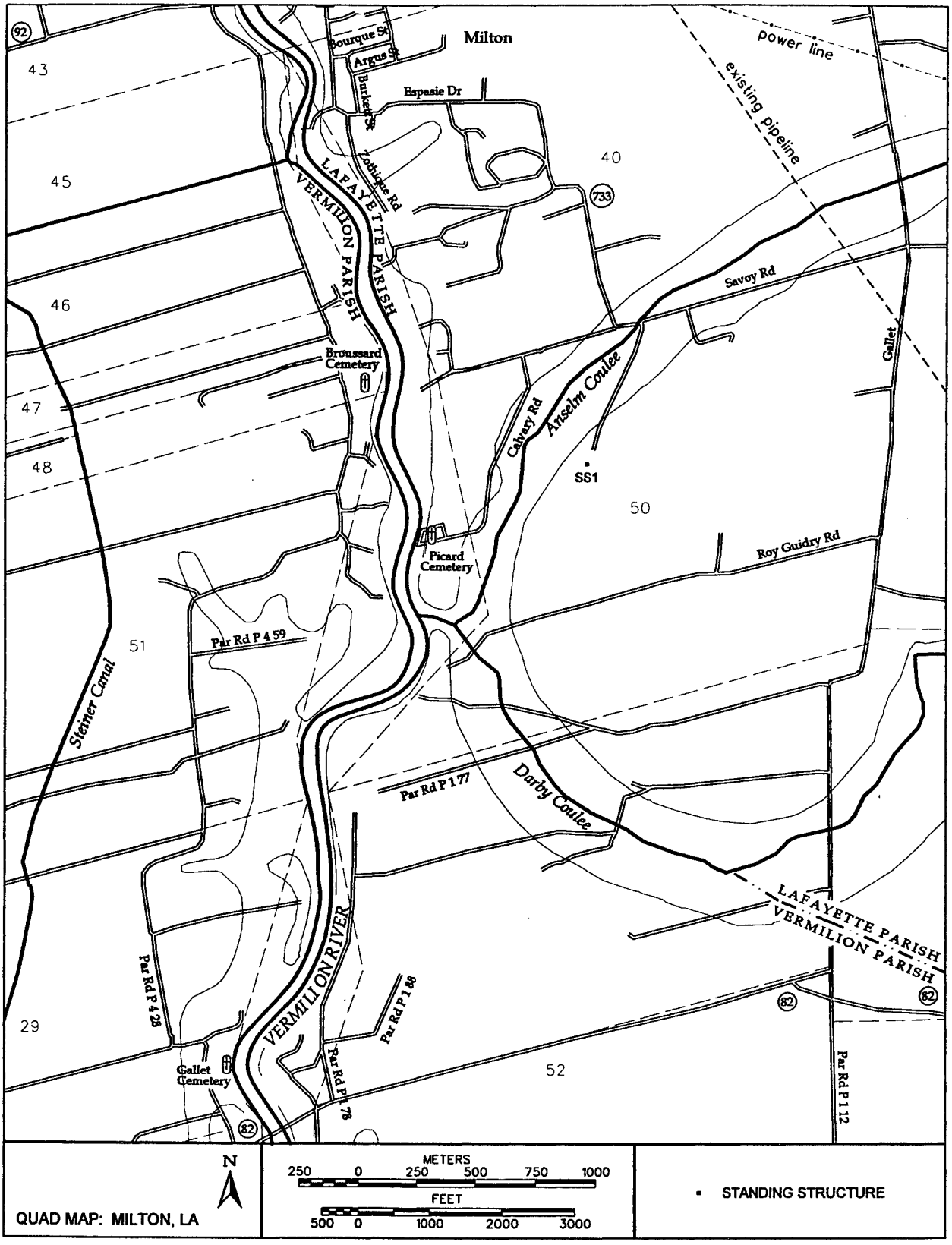
(Describe important architectural features and evaluate in terms of other buildings within the community)

Typical example of a utilitarian farm structure, warranting a not significant designation

D. **HISTORICAL SIGNIFICANCE:**

(Explain the role owners played in local or state history and how the building relates to the development of the community)

Limited historical significance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VERMILION RIVER
Par Rd P 428
Par Rd P 148
Par Rd P 178
Gallet Cemetery
Par Rd P 112
43
45
46
47
48
40
50
51
29
52
92
733
82
N
METERS
250 0 250 500 750 1000
FEET
500 0 1000 2000 3000
QUAD MAP: MILTON, LA
STANDING STRUCTURE